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(54) SYSTEM FOR SETTING MACHINE FACILITY MAINTENANCE CHARGE AND SYSTEM FOR SETTING MACHINE FACILITY INSURANCE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a system for setting maintenance charge and insurance for allowing a machine facility user to reduce maintenance charge and insurance according to the maintenance of a machine facility, and for allowing a maker to reduce maintenance charge payment, and for allowing an insurance company to reduce insurance money payment.

SOLUTION: This system is provided with a machine facility user 12 equipped with a facility operation system having a machine facility 9 and an accounting server 14, a maker 28 equipped with a maintenance evaluating system 33 and a charge management server 34, and a financial mediating station 13. The maintenance evaluating system 33 acquires maintenance information related with the machine equipment 9 from the facility operation system 3 based on an insurance contract, and decides the maintenance charge based on the maintenance contract and the maintenance information, and outputs the instruction of the next maintenance charge payment to a charge management server 37, and the charge management server 37 notifies the accounting server 14 of the next maintenance charge based on the instruction of the next maintenance charge payment, and the accounting server 14 transfers the next insurance expense to the account of the maker 28 through the financial mediating station 13 in response to the notification.
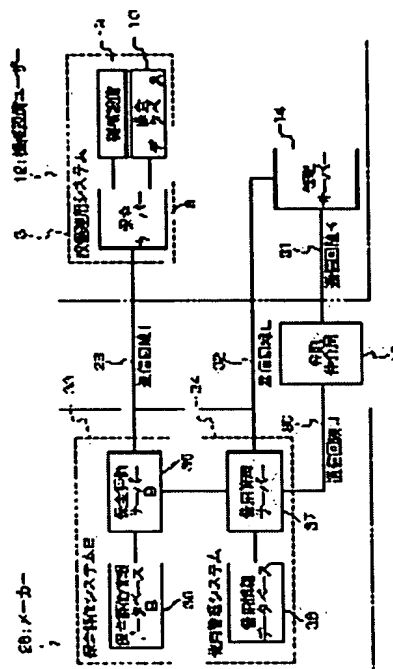
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CLAIMS

[Claim(s)]
[Claim 1] A machine user station equipped with the facility operations system which has a machine, and an accounting server. A manufacturer station equipped with a maintenance evaluation system and a costs management server, and a financial agency station. Provide and said maintenance evaluation system is based on the maintenance contract about the first half machine between said machine user stations and said manufacturer stations. The maintenance information about said machine is acquired from said facility operations system through a communication line. Based on said maintenance contract and said maintenance information, determine the charge of maintenance, and the charge payment directions of maintenance are outputted to said costs management server next time. Said costs management server notifies said accounting server of the charge of maintenance through a communication line said next time said next time based on the charge payment directions of maintenance, and said accounting server answers said notice and sets to said financial agency station. The charge setting system of machine maintenance which transfers the charge of maintenance to the account of said manufacturer station said next time.

[Claim 2] A machine user station equipped with the facility operations system which has a machine, and an accounting server. A manufacturer station equipped with remote monitoring system, a maintenance evaluation system, and a costs management server, It is based on a contract. maintenance provide a financial agency station and concerning [said remote monitoring system] the first half machine between said machine user stations and said manufacturer stations -- harshness -- The employment information about the employment situation of said machine to said machine is acquired through a communication line. Said maintenance evaluation system acquires the maintenance information about said machine from said facility operations system through a communication line based on said maintenance contract. The charge of maintenance is determined based on said maintenance contract, said employment information, and said maintenance information. The charge payment directions of maintenance are outputted to said costs management server next time. Said costs management server notifies said accounting server is notified of the charge of maintenance through a communication line said next time said next time based on the charge payment directions of maintenance, and said accounting server answers said notice, and transfers the charge of maintenance to the account of said manufacturer station in said financial agency station said next time.

[Claim 3] With the maintenance evaluation server with which said maintenance evaluation system acquires said maintenance information from said facility operations system The maintenance evaluation information database holding the information about modification of said charge of maintenance beforehand set up based on said maintenance information and said maintenance contract is provided. Said maintenance evaluation server The charge setting system of machine maintenance according to claim 1 which determines said charge of maintenance based on said maintenance evaluation information database holds, and the maintenance information which said maintenance evaluation information database holds, and the information about said modification, and outputs the charge payment directions of maintenance to said costs management server said next time.

[Claim 4] Said maintenance information is a charge setting system of machine maintenance according to claim 1 or 3 which is the information in connection with maintenance of said machine obtained based on the risk base maintenance method.

[Claim 5] With the remote monitor server with which said remote monitoring system acquires said employment information from said machine The device information database holding the correction factor information about the employment conditions of said machine beforehand set up based on said employment information and said maintenance contract is provided. Said maintenance evaluation server With the maintenance evaluation server which acquires said maintenance information from said facility operations system The maintenance evaluation information database holding the information about modification of said charge of maintenance beforehand set up based on the contract is provided. said maintenance information and said maintenance -- harshness -- said-remote monitor server A correction factor is determined based on said employment information which said device information database holds, and said correction factor information. Said correction factor and part of said employment information are outputted to said maintenance evaluation server. Said maintenance evaluation server The charge setting system of machine maintenance according to claim 2 which determines said charge of maintenance based on a part of said maintenance information which said maintenance evaluation information database holds, information about said modification, said correction factor, and said employment information, and outputs the charge payment directions of maintenance to said costs management server said next time.

[Claim 6] It is the charge setting system of machine maintenance according to claim 5 which is the information in connection with maintenance of said machine from which said employment conditions are set up based on at least one of the output of said machine, the count of start and stop, and output rate of change, and said maintenance information is acquired based on the risk base maintenance method.

[Claim 7] The charge setting system of machine maintenance given in any 1 term of claim 2 and claim 5 by which said remote monitoring system is contained in said maintenance evaluation system, and claim 6.

[Claim 8] The charge setting system of machine maintenance given in claim 1 thru/or any 1 term of 7 by which said costs management server is contained in said maintenance evaluation system.

[Claim 9] A machine user station equipped with the facility operations system which has a machine, and an accounting server, An insurance-company station equipped with a maintenance evaluation system and a premium management server, Provide a financial agency station and said maintenance evaluation system is based on the insurance about the first half machine between said machine user stations and said insurance-company stations. The maintenance information about said machine is acquired from said facility operations system through a communication line. Based on said insurance and said maintenance information, determine a premium, and premium payment directions are outputted to said premium management server next time. Said premium management server notifies said accounting server of a premium through a communication line said next time said next time based on premium payment directions, and said accounting server answers said notice and sets to said financial agency station. The machine premium setting system which transfers a premium to the account of said insurance-company station said next time.

[Claim 10] A machine user station equipped with the facility operations system which has a machine, and an accounting server, An insurance-company station equipped with remote monitoring system, a maintenance evaluation system, and a premium management server, Provide a financial agency station and said remote monitoring system is based on the insurance about the first half machine between said machine user stations and said insurance-company stations. The employment information about the employment situation of said machine to said machine is acquired through a communication line. Said maintenance evaluation system acquires the maintenance information about said machine from said facility operations system through a communication line based on said insurance. A premium is determined based on said insurance, said employment information, and said maintenance information. Premium payment directions are

outputted to said premium management server next time. Said premium management server The machine premium setting system by which said accounting server is notified of a premium through a communication line said next time said next time based on premium payment directions, and said accounting server answers said notice, and transfers a premium to the account of said insurance-company station in said financial agency station said next time.

[Claim 11] With the maintenance evaluation server with which said maintenance evaluation system acquires said maintenance information from said facility operations system The maintenance evaluation information database holding the information about modification of said premium beforehand set up based on said maintenance information and said insurance is provided. Said maintenance evaluation server The machine premium setting system according to claim 9 which determines said premium based on said maintenance information which said maintenance evaluation information database holds, and the information about said modification, and outputs premium payment directions to said premium management server said next time.

[Claim 12] Said maintenance information is a machine premium setting system according to claim 9 or 11 which is the information in connection with maintenance of said machine obtained based on the risk base maintenance method.

[Claim 13] With the remote monitor server with which said remote monitoring system acquires said employment information from said machine The device information database holding the correction factor information about the employment conditions of said machine beforehand set up based on said employment information and said insurance is provided. Said maintenance evaluation system With the maintenance evaluation server which acquires said maintenance information from said facility operations system The maintenance evaluation information database holding the information about modification of said premium beforehand set up based on database holding the information about modification of said premium beforehand set up based on said maintenance information and said insurance is provided. Said remote monitor server A said maintenance information and said insurance is provided. Said remote monitor server A correction factor is determined based on said employment information which said device information database holds, and said correction factor information. Said correction factor and information database holds, and said correction factor information. Said correction factor and part of said employment information are outputted to said maintenance evaluation server. Said maintenance evaluation server The machine premium setting system according to claim 10 which determines said premium based on a part of said maintenance information which said maintenance evaluation information database holds, information about said modification, said correction factor, and said employment information, and outputs premium payment directions to said premium management server said next time.

[Claim 14] It is the machine premium setting system according to claim 13 which is the machine premium setting system in connection with maintenance of said machine from which said employment information is acquired based on at least one of the output of said machine, the count of start and stop, and output rate of change, and said maintenance information is acquired based on the risk base maintenance method.

[Claim 15] A machine premium setting system given in any 1 term of claim 10 and claim 13 by which said remote monitoring system is contained in said maintenance evaluation system, and claim 14.

[Claim 16] A machine premium setting system given in claim 9 thru/or any 1 term of 15 by which said premium management server is contained in said maintenance evaluation system.

[Claim 17] Based on the maintenance contract about the machine between a machine user station and a manufacturer station, said machine user station sets to a financial agency station through a communication line. The step which pays the charge of maintenance to said manufacturer station, and the step to which said manufacturer station acquires the maintenance information about the maintenance situation of said machine from said machine user station through a communication line based on said maintenance contract. The step to which said manufacturer station determines the charge of maintenance based on said maintenance contract and said maintenance information, and outputs the charge payment directions of maintenance next time. The step which said manufacturer station notifies through a communication line that the charge of maintenance is to said machine user station said next time said next time based on the charge directions of maintenance. The charge setting approach of machine maintenance of providing the step at which said machine user station answers said notice, and transfers the

charge of maintenance to the account of said manufacturer station in said financial agency station through a communication line said next time.

[Claim 18] Based on the maintenance contract about the machine between a machine user station and a manufacturer station, said machine user station sets to a financial agency station through a communication line. The step which pays the charge of maintenance to said manufacturer station, and the step to which said manufacturer station acquires the employment information about the employment situation of said machine from said machine user station through a communication line based on a front maintenance contract. The step to which said manufacturer station acquires the maintenance information about the maintenance situation of said machine from said machine user station through a communication line based on said maintenance contract. The step to which said manufacturer station determines the charge of maintenance based on said maintenance contract, said employment information, and said maintenance information, and outputs the charge payment directions of maintenance next time. The step which said manufacturer station notifies through a communication line that the charge of maintenance is to said machine user station said next time said based on the charge directions of maintenance. The charge setting approach of machine maintenance of providing the step at which said machine user station answers said notice, and transfers the charge of maintenance to the account of said manufacturer station in said financial agency station through a communication line said next time.

[Claim 19] Based on the insurance about the machine between a machine user station and an insurance-company station, said machine user station sets to a financial agency station through a communication line. The step which pays a premium to said insurance-company station, and the step to which said insurance-company station acquires the maintenance information about the maintenance situation of said machine from said machine user station through a communication line based on said insurance. The step to which said insurance-company station determines a premium based on said insurance and said maintenance information, and outputs premium payment directions next time. The step which said insurance-company station notifies through a communication line that a premium is to said machine user station said next time said next time based on premium directions. The machine premium setting approach of providing the step at which said machine user station answers said notice, and transfers a premium to the account of said insurance-company station in said financial agency station through a communication line said next time.

[Claim 20] Based on the insurance about the machine between a machine user station and an insurance-company station, said machine user station sets to a financial agency station through a communication line. The step which pays a premium to said insurance-company station, and the step to which said insurance-company station acquires the employment information about the employment situation of said machine from said machine user station through a communication line based on said insurance. The step to which said insurance-company station acquires the maintenance information about the maintenance situation of said machine from said machine user station through a communication line based on said insurance. The step to which said insurance-company station determines a premium based on said insurance, said employment information, and said maintenance information, and outputs premium payment directions next time. The step which said insurance-company station notifies through a communication line that a premium is to said machine user station said next time said next time based on premium directions. The machine premium setting approach of providing the step at which said machine user station answers said notice, and transfers a premium to the account of said insurance-company station in said financial agency station through a communication line said next time.

[Claim 21] The program for answering the charge payment directions of maintenance the next time when it is generated based on the step which checks the payment of the charge of maintenance from said machine user station, and the maintenance information about a maintenance situation and said maintenance contract of said machine based on the maintenance contract about the machine of a machine user station and a manufacturer station, and performing the step which notifies the charge of maintenance to said machine user station said

next time through a communication line.
[Claim 22] The program for answering the charge payment directions of maintenance the next time when it is generated based on the step which checks the payment of the charge of maintenance from said machine user station, and the employment information about an employment situation, the maintenance information about maintenance information and said maintenance contract of said machine based on the maintenance contract about the machine of a machine user station and a manufacturer station, and performing the step which notifies the charge of maintenance to said machine user station said next time through a communication line.

[Claim 23] The program for answering premium payment directions the next time when it is generated based on the step which checks the payment of the premium from said machine user station, and the maintenance information about a maintenance situation and said insurance of said machine based on the insurance about the machine of a machine user station and an insurance-company station, and performing the step which notifies a premium to said machine user station said next time through a communication line.
[Claim 24] The program for answering premium payment directions the next time when it is generated based on the step which checks the payment of the premium from said machine user station, and the employment information about an employment situation, the maintenance information about maintenance information and said insurance of said machine based on the insurance about the machine of a machine user station and an insurance-company station, and performing the step which notifies a premium to said machine user station said next time through a communication line.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the system which sets up the charge of maintenance and premium of a machine.
[0002]
[Description of the Prior Art] A maintenance contract is exchanged among the machine users as a machine user station which is the manufacturer and purchaser as a manufacturer station who manufactured the machine in the case of machine sale. In the maintenance contract, the charge of maintenance to the maintenance which a manufacturer performs is mainly determined based on the following conditions. That is, they are the failure rate (lambdam) of ** machine proper, the use elapsed years (refer to the use elapsed-years correction factor Ky and drawing 5) of ** machine, and the release time at the time of ** failure (Tr). However, by this approach, by the machine of the same class, if use elapsed years are the same, the same charge of maintenance will be applied.
[0003] On the other hand, the machine user as a machine user station insures a machine in preparation for generating of damage in many cases in the case of the purchase of a machine. The calculation approach of the premium in that case is also mainly set up based on the conditions of above ** - **, and the same premium will be applied if use elapsed years are the same at the machine of the same class.
[0004] Therefore, neither of charges of maintenance and premiums are reflecting the availability based on the employment situation of a machine, the operation approach, the employment hysteresis till then, etc. Moreover, although the detection time amount of failure is shortened when the remote monitor of the machine is carried out, it is not taken into consideration about the effectiveness (for example, an operating ratio should improve), either.
[0005] However, employment of a machine does not observe the rated value or the design upper limit which are the employment conditions which are various and were not necessarily recommended by the machine user who deals with it, and is not necessarily operating. That is, according to a situation, employment with the output in a performance limit, employment accompanied by the start and stop in the high frequency which is not assumed on a design and output fluctuation, etc. are carried out. In the case where they are performed in the employment process of a machine, the failure incidence rate of a machine becomes high as compared with general employment. Therefore, if same above charges of maintenance and premiums are applied, the loss which is not assumed may be generated for the insurance company as an insurance-company station which pays the manufacturer and insurance money which perform maintenance.

[0006] The employment condition of a gas turbine is mentioned as an example, and each factor to which the incidence rate of failure becomes high is explained with reference to drawing 6 - drawing 8 . Drawing 6 shows the relation between the output of a gas turbine, and a failure incidence rate. An axis of abscissa is the output (%) of a gas turbine, and is the value standardized with the horsepower output. An axis of ordinate is a failure incidence rate (%). In employment of a gas turbine, and a failure value (left-hand side arrow head in drawing) of

an output is set up and it applies below with the value. However, in operating exceeding the rated value of an output, it turns out that a failure incidence rate becomes very high (the range of ** and **).
[0007] Drawing 7 shows the relation between the count of start and stop of a gas turbine, and a failure incidence rate. An axis of abscissa is the count of start and stop (the count of starting and a halt, a time/period) of per a unit period (for example, moon) of a gas turbine, and an axis of ordinate is a failure incidence rate (%). In employment of a gas turbine, the count of start and stop of per a unit period (for example, moon) is assumed by the design stage as a design upper limit (left-hand side arrow head in drawing), and the failure incidence rate has stopped at the low value about the start and stop below the value (the range of **). However, when the count of start and stop exceeds a design upper limit, it turns out that a failure incidence rate becomes very high (the range of ** and **).
[0008] Drawing 8 shows the relation between the output rate of change of a gas turbine, and a failure incidence rate. An axis of abscissa is the output rate of change (change of the output of per unit time amount (for example, time amount) comparatively %) of a gas turbine. An axis of ordinate is a failure incidence rate (%). In employment of a gas turbine, output rate of change is assumed by the design stage as a design upper limit (left-hand side arrow head in drawing), and the failure incidence rate has stopped at the low value about the output change below the value (the range of **). However, when output rate of change exceeds a design upper limit, it turns out that a failure incidence rate becomes very high (the range of ** and **).
[0009] As mentioned above, as compared with the machine to which employment with the output in a performance limit and the employment of a machine which is the start and stop in the high frequency which is not assumed on a design and output fluctuation, and was performed in the range of ** of 8 and drawing 6 - <GAIID=0003> ** were applying in the range of **, a failure incidence rate becomes high clearly. therefore -- since the failure rate of a machine will vary greatly according to the employment condition of a device facility, if in charge of the charge of maintenance, and premium calculation -- to some extent -- an insurance side -- not evaluating -- it does not obtain but the charge of maintenance and a premium tend to be set up highly.
[0010] On the other hand, the machine user who uses a machine has usually devised the policy which is going to control the increment in a failure rate by preserving periodically (maintenance). However, since the funds and time amount for preserving are not in infinity, a machine user is unable to perform all the maintenance considered to be need in many cases. Therefore, it becomes an important point by preserving appropriately as efficiently as possible whether use of a machine is continued without failure. That is, though preserved, it is decided by whether it is made appropriately whether a failure rate will fall. Therefore, when same above charges of maintenance and premiums which are not taking those situations into consideration are applied, the loss which is not assumed may be generated for the insurance company as the manufacturer and insurance-company station as a manufacturer station. Therefore, the charge setting system of machine maintenance and machine premium setting system to which I also have a machine user be convinced are needed, avoiding it.
[0011]
[Problem(s) to be Solved by the Invention] Therefore, the purpose of this invention is offering the charge setting system of machine maintenance and the charge setting approach of machine maintenance of bringing the both sides of a manufacturer and a machine user profits.
[0012] Moreover, another purpose of this invention is offering the charge setting system of machine maintenance which can set up the charge of maintenance with a more high precision, and the charge setting approach of machine maintenance by operating ratio prediction with a high precision based on the maintenance plan of a machine.
[0013] Furthermore, other purposes of this invention are offering the charge setting system of machine maintenance which can improve the charge of maintenance by improvement of the maintenance plan technique of a machine user's machine, and the charge setting approach of machine maintenance.
[0014] Furthermore, other purposes of this invention are offering the charge setting system of machine maintenance which can improve the charge of maintenance by improvement of the

employment situation of a machine user's machine. and the charge setting approach of machine maintenance.

[0015] Furthermore, other purposes of this invention are offering the machine premium setting system and the machine premium setting approach of bringing the both sides of an insurance company and a machine user profits.

[0016] Furthermore, other purposes of this invention are offering the machine premium setting system which can set up a premium with a more high precision, and the machine premium setting approach by operating ratio prediction with a high precision based on the maintenance plan of a machine.

[0017] Furthermore, other purposes of this invention are offering the machine premium setting system which can improve a premium by improvement of the maintenance plan technique of a machine user's machine. and the machine premium setting approach.

[0018] Furthermore, other purposes of this invention are offering the machine premium setting system which can improve a premium by improvement of the employment situation of a machine user's machine, and the machine premium setting approach.

[0019]

[Means for Solving the Problem] The figure number in the term of this The means for solving a technical problem and a sign must not be described in order to show correspondence with a claim and the gestalt of implementation of invention, and don't use them for the interpretation of a claim.

[0020] In order to solve the above-mentioned technical problem, therefore, the charge setting system of machine maintenance of this invention A machine user office (drawing 1, machine user 12) equipped with the facility operations system which has a machine (drawing 1, machine 9), and an accounting server (drawing 1, accounting server 14). A manufacturer office (drawing 1, manufacturer 28) equipped with a maintenance evaluation system (drawing 1, maintenance evaluation system B33) and a costs management server (drawing 1, costs management server (drawing 1, costs management server 34) and a financial agency office (drawing 1, financial agency office 13) are provided. And said maintenance evaluation system (drawing 1, maintenance evaluation system B33) acquires the maintenance information about said machine (drawing 1, machine 9) from said facility operations system (drawing 1, facility operations system 3) through a communication line (drawing 1, communication line 129) based on the maintenance contract about the first half machine (drawing 1, machine 9) between said machine user offices (drawing 1, machine user 12) and said manufacturer offices (drawing 1, manufacturer 28). Next, the charge of maintenance is determined based on said maintenance contract and said maintenance information, and the charge payment directions of maintenance are outputted to said costs management server (drawing 1, costs management server 37) next time. Then, said costs management server (drawing 1, costs management server 37) notifies said accounting server (drawing 1, accounting server 14) of the charge of maintenance through a communication line (drawing 1, communication line L32) said next time said next time based on the charge payment directions of maintenance. And said accounting server (drawing 1, accounting server 14) answers said notice, and transfers a premium to the account of said manufacturer office (drawing 1, manufacturer 28) said next time in said financial agency office (drawing 1, financial agency office 13).

[0021] Moreover, the charge setting system of machine maintenance of this invention The facility operations system which has a machine (drawing 12, machine 9) (drawing 12, facility operations system 3). A machine user office (drawing 12, machine user 12) equipped with an accounting server (drawing 12, accounting server 14). Remote monitoring system (drawing 12, remote monitoring system 25) and a maintenance evaluation system (drawing 12, maintenance evaluation system B33). A manufacturer office (drawing 12, manufacturer 28) equipped with a maintenance evaluation server (drawing 12, costs management server 37) and a financial agency costs management server (drawing 12, costs management server 37) and a financial agency office (drawing 12, financial agency office 13) are provided. and maintenance concerning [said remote monitoring system (drawing 12, remote monitoring system 25)] the first half machine (drawing 12, machine user 12) and (drawing 12, machine 9) between said machine user offices (drawing 12, machine user 12) and said manufacturer offices (drawing 12, manufacturer 28) -- harshness -- based on a contract,

the employment information about the employment situation of said machine (drawing 12, communication line 9) is acquired from said communication line (drawing 12, communication line 129). Moreover, said 9) through a communication line (drawing 12, communication line 129), maintenance evaluation system (drawing 12, maintenance evaluation system B33) acquires the maintenance information about said machine (drawing 12, machine 9) from said facility operations system (drawing 12, facility operations system 3) through a communication line (drawing 12, communication line 129) based on said maintenance contract. And the charge of maintenance is determined based on said maintenance contract, said employment information. and said maintenance information, and the charge payment directions of maintenance are outputted to said costs management server (drawing 12, costs management server 34) next time. Next, said costs management server (drawing 12, costs management server 34) notifies said accounting server (drawing 12, accounting server 14) of the charge of maintenance through a communication line (drawing 12, communication line L32) said next time said next time based on the charge payment directions of maintenance. And said accounting server (drawing 12, accounting server 14) answers said notice, and transfers the charge of maintenance to the account of said manufacturer office (drawing 12, manufacturer 28) said next time in said financial agency office (drawing 12, financial agency office 13).

[0022] Moreover, the charge setting system of machine maintenance of this invention provides the maintenance evaluation server (drawing 1, maintenance evaluation server B35) with which said maintenance evaluation system (drawing 1, maintenance evaluation system B33) acquires said maintenance information from said facility operations system (drawing 1, facility operations system 3), and the maintenance evaluation information database (drawing 1, maintenance evaluation information database B36) holding the information about modification of said charge of maintenance to which it was beforehand set based on said maintenance information and said maintenance contract. And said maintenance evaluation server (drawing 1, maintenance evaluation server B35) determines said charge of maintenance based on said maintenance information which said maintenance evaluation information database (drawing 1, maintenance evaluation information database B36) holds, and the information about said modification, and outputs the charge payment directions of maintenance to said costs management server (drawing 1, costs management server 37) said next time.

[0023] Furthermore, the charge setting system of machine maintenance of this invention is the information in connection with maintenance of said machine (drawing 1, machine 9) from which said maintenance information is acquired based on the risk base maintenance method.

[0024] Furthermore, the charge setting system of machine maintenance of this invention possesses the remote monitor server (drawing 12, remote monitor server 22) with which said remote monitoring system (drawing 12, remote monitoring system 25) acquires said employment information from said machine (drawing 12, machine 9). and the device information database (drawing 12, device information database 23) holding the correction factor information about the employment conditions of said machine (drawing 12, machine 9) of having been beforehand set up based on said employment information and said maintenance contract. moreover, the maintenance evaluation server (drawing 12, maintenance evaluation server B35) with which said maintenance evaluation system (drawing 12, maintenance evaluation system B33) acquires said maintenance information from said facility operations system (drawing 12, facility operations system 3), and said maintenance information and said maintenance -- harshness -- the maintenance evaluation information database (drawing 12, a maintenance evaluation information database B36) holding the information about modification of said charge of maintenance beforehand set up based on the contract provides. Said remote monitor server (drawing 12, remote monitor server 22) determines a correction factor based on said employment information which said device information database (drawing 12, device information database 23) holds, and said correction factor information, and outputs said correction factor and part of said employment information to said maintenance evaluation server (drawing 12, maintenance evaluation server B35). And said maintenance evaluation server (drawing 12, maintenance evaluation server B35) determines said charge of maintenance based on a part of maintenance evaluation information which said maintenance evaluation information database (drawing

12 . maintenance evaluation information database B36) holds, information about said modification, said correction factor, and said employment information, and outputs the charge payment directions of maintenance to said costs management server (drawing 12 . costs management server 37) said next time.

[0025] Furthermore, as for the charge setting system of machine maintenance of this invention, said employment conditions are set up based on at least one of the output of said machine (drawing 12 . machine 9), the count of start and stop, and output rate of change, and said maintenance information is the information in connection with maintenance of said machine (drawing 12 . machine 9) obtained based on the risk base maintenance method.

[0026] Furthermore, as for the charge setting system of machine maintenance of this invention, said remote monitoring system (drawing 12 . remote monitoring system 25) is contained in said maintenance evaluation system (drawing 12 . maintenance evaluation system B33).

[0027] Furthermore, as for the charge setting system of machine maintenance of this invention, said costs management server (drawing 1 . 12 . costs management server 37) is contained in said maintenance evaluation system (drawing 1 . 12 . maintenance evaluation system B33).

[0028] In order to solve the above-mentioned technical problem, the machine premium setting system of this invention The facility operations system which has a machine (drawing 20 . machine user office (drawing 20 . facility operations system 3). A machine user office (drawing 20 . accounting server 14). An machine user office 12) equipped with an accounting server (drawing 20 . accounting server 14). An insurance-company office (drawing 20 . insurance company 11) equipped with a maintenance evaluation system (drawing 20 . maintenance evaluation system 1) and a premium management server (drawing 20 . premium management server 6) and a financial agency office (drawing 20 . financial agency office 13) are provided. Said maintenance evaluation system 1) acquires the maintenance information about said machine (drawing 20 . machine 9) from said facility operations system (drawing 20 . facility operations system 3) through a communication line (drawing 20 . communication line A15) based on the insurance about the first half machine (drawing 20 . machine user 12) between said machine user offices (drawing 20 . machine user 12) and said insurance-company offices (drawing 20 . insurance company 11). And a premium is determined based on said insurance and said maintenance information, and premium payment directions are outputted to said premium management server (drawing 20 . premium management server 6) next time. Next, said premium management server (drawing 20 . premium management server 6) notifies said accounting server (drawing 20 . accounting server 14) of a premium through a communication line (drawing 20 . communication line D18) said next time said next time based on premium payment directions. And said accounting server (drawing 20 . accounting server 14) answers said notice, and transfers a premium to the account of said insurance-company office (drawing 20 . insurance company 11) in a financial agency office (drawing 25 . financial agency office 13) said next time.

[0029] Moreover, the machine premium setting system of this invention The facility operations system which has a machine (drawing 25 . machine 9) (drawing 25 . facility operations system 3). A machine user office (drawing 25 . machine user 12) equipped with an accounting server (drawing 25 . accounting server 14). Remote monitoring system (drawing 25 . remote monitoring system 25) and a maintenance evaluation system (drawing 25 . maintenance evaluation system 1). An insurance-company office (drawing 25 . insurance company 11) equipped with a premium management server (drawing 25 . premium management server 6) and a financial agency office (drawing 25 . financial agency office 13) are provided. Said remote monitoring system (drawing 25 . remote monitoring system 25) acquires the employment information about the employment situation of said machine (drawing 25 . machine 9) to said machine (drawing 25 . machine 9) through a communication line (drawing 25 . communication line A15) based on the insurance about the first half machine (drawing 25 . machine user 12) between said machine user offices (drawing 25 . machine user 12) and said insurance-company offices (drawing 25 . insurance company 11). On the other hand, said maintenance information about said machine (drawing 25 . maintenance evaluation system 1) acquires the maintenance information about said machine (drawing 25 . facility operations system 3) from said facility operations system (drawing 25 . facility operations system 3) machine 9) from said facility operations system (drawing 25 . communication line A15) based on said insurance.

And a premium is determined based on said insurance, said employment information, and said maintenance information, and premium payment directions are outputted to said premium management server (drawing 25 . premium management server 6) next time. Next, said premium management server (drawing 25 . premium management server 6) notifies said accounting server (drawing 25 . accounting server 14) of a premium through a communication line (drawing 25 . communication line D18) said next time said next time based on premium payment directions. And said accounting server (drawing 25 . said accounting server 14) answers said notice, and transfers a premium to the account of said insurance-company office (drawing 25 . insurance company 11) in a financial agency office (drawing 25 . financial agency office 13) said next time.

[0030] Furthermore, the machine premium setting system of this invention possesses the maintenance evaluation server (drawing 20 . maintenance evaluation server 4) with which said maintenance evaluation system (drawing 20 . maintenance evaluation system 1) acquires said maintenance information from said facility operations system (drawing 20 . facility operations system 3). and the maintenance evaluation information database (drawing 20 . maintenance evaluation information database 5) holding the information about modification of said premium to which it was beforehand set based on said maintenance information and said insurance. And said maintenance evaluation server (drawing 20 . 4 maintenance evaluation server) determines said premium based on said maintenance information which said maintenance evaluation information database (drawing 20 . maintenance evaluation information database 5) holds, and the information about said modification, and outputs premium payment directions to said premium management server (drawing 20 . premium management server 14) said next time.

[0031] Furthermore. the machine premium setting system of this invention is the information in connection with maintenance of said machine (drawing 20 . machine 9) from which said maintenance information is acquired based on the risk base maintenance method.

[0032] Furthermore, the machine premium setting system of this invention possesses the remote monitor server (drawing 25 . remote monitor server 22) with which said remote monitoring system (drawing 25 . remote monitoring system 25) acquires said employment information from said machine (drawing 25 . machine 9), and the device information database (drawing 25 . device information database 23) holding the correction factor information about the employment conditions of said machine (drawing 25 . machine 9) of having been beforehand set up based on said employment information and said insurance. Said maintenance evaluation system (drawing 25 . maintenance evaluation system 1) possesses the maintenance evaluation server (drawing 25 . all evaluation servers 4) which acquires said maintenance information from said facility operations system (drawing 25 . facility operations system 3), and the maintenance evaluation information database (drawing 25 . maintenance evaluation information database 5) holding the information about modification of said premium beforehand set up based on said maintenance information and said insurance. And said remote monitor server (drawing 25 . remote monitor server 22) determines a correction factor based on said employment information which said device information database (drawing 25 . device information database 23) holds, and said correction factor information, and outputs said correction factor and part of said employment information to said maintenance evaluation server (drawing 25 . maintenance evaluation server 4). Next, said maintenance evaluation server (drawing 25 . maintenance evaluation server 4) determines said premium based on said maintenance information which said maintenance evaluation information database (drawing 25 . maintenance evaluation information database 5) holds, the information about said modification, said correction factor, and said a part of employment information, and outputs premium payment directions to said premium management server (drawing 25 . premium management server 6) said next time.

[0033] Furthermore, the machine premium setting system of this invention is set up based on at least one of the output of said machine (drawing 25 . machine 9), the count of start and stop, and output rate of change, and said employment conditions of it are the information in connection with maintenance of said machine (drawing 25 . machine 9) from which said maintenance information is acquired based on the risk base maintenance method.

[0034] Furthermore, as for the machine premium setting system of this invention, said remote monitoring system (drawing 25 . 25) is contained in said maintenance evaluation system

(drawing 25 , maintenance evaluation system 1).

[0035] Furthermore, as for the machine premium setting system of this invention, said premium management server (drawing 20 , 12, premium management server 6) is contained in said maintenance evaluation system (drawing 20 , 12, maintenance evaluation system 1).

[0036] The charge setting approach of machine maintenance of this invention for solving the above-mentioned technical problem It is based on the maintenance contract about the machine (drawing 1 , machine 9) between a machine user office (drawing 1 , machine user 12) and a manufacturer office (drawing 1 , manufacturer 28). Said machine user office (drawing 1 , financial agency office 13) sets to a financial agency office (drawing 1 , communication line K31). The step which pays the charge of maintenance to said manufacturer office (drawing 1 , manufacturer 28). Said manufacturer office (drawing 1 , manufacturer 28) is based on said maintenance contract. The step which acquires the maintenance information about the maintenance situation of said machine (drawing 1 , machine 9) from said machine user office (drawing 1 , machine user 12) through a communication line (drawing 1 , communication line 129). The step to which said manufacturer office (drawing 1 , manufacturer 28) determines the charge of maintenance based on said maintenance contract and said maintenance information, and outputs the charge payment directions of maintenance next time. Said manufacturer office (drawing 1 , manufacturer 28) is based on the charge directions of maintenance said next time. The step which notifies the charge of maintenance to said machine user office (drawing 1 , machine user 12) through a communication line (drawing 1 , communication line L32) said next time. Said machine user office (drawing 1 , machine user 12) answers said notice, and sets through a communication line (drawing 1 , communication line K31) to said financial agency office 13). The step which transfers the charge of maintenance to the account of said manufacturer office (drawing 1 , manufacturer 28) said next time is provided.

[0037] Moreover, the charge setting approach of machine maintenance of this invention is based on the maintenance contract about the machine (drawing 12, machine 9) between a machine user office (drawing 12, machine user 12) and a manufacturer office (drawing 12, manufacturer 28) said next time. Said machine user office (drawing 12, machine user 12) sets to a financial agency office (drawing 12, financial agency office 13) through a communication line (drawing 12, communication line K31). The step which pays the charge of maintenance to said manufacturer to said manufacturer office (drawing 12, manufacturer 28) is based on a front line K31). The step which pays the charge of maintenance to said manufacturer to said manufacturer office (drawing 12, manufacturer 28) is based on a front 12, manufacturer 28). Said manufacturer office (drawing 12, manufacturer 28) determines the charge of maintenance based on the maintenance contract. The step which acquires the employment information about the employment situation of said machine (drawing 12, machine 9) from said machine user office (drawing 12, machine user 12) through a communication line (drawing 12, communication line 129). Said manufacturer office (drawing 12, manufacturer 28) is based on said maintenance contract. The step which notifies the charge of maintenance to said machine user office (drawing 12, machine user 12) through a communication line (drawing 12, communication line L32) said next time. Said machine user office (drawing 12, machine user 12) answers said notice, and sets through a communication line (drawing 12, communication line K31) to said financial agency office (drawing 12, financial agency office 13). The step which transfers the charge of maintenance to the account of said manufacturer office (drawing 12, manufacturer 28) said next time is provided.

[0038] The machine premium setting approach of this invention for solving the above-mentioned technical problem It is based on the insurance about the machine (drawing 20, machine 9) between a machine user office (drawing 20, machine user 12) and an insurance-company office (drawing 20, insurance company 11). Said machine user office (drawing 20, machine user 12) sets

to a financial agency office (drawing 20, financial agency office 13) through a communication line (drawing 20, communication line C17). The step which pays a premium to said insurance-company office (drawing 20, insurance company 11). Said insurance-company office (drawing 20, insurance company 11) is based on said insurance. The step which acquires the maintenance information about the maintenance situation of said machine (drawing 20, machine 9) from said machine user office (drawing 20, machine user 12) through a communication line (drawing 20. machine user office communication line A15). The step to which said insurance-company office (drawing 20, insurance company 11) determines a premium based on said insurance and said maintenance information, and outputs premium payment directions next time. Said insurance-company office (drawing 20, insurance company 11) is based on premium directions said next time. The step which notifies a premium to said machine user office (drawing 20, machine user 12) through a communication line (drawing 20, communication line D18) said next time. Said machine user office (drawing 20, machine user 12) answers said notice, and sets through a communication line (drawing 20, communication line C17) to said financial agency office (drawing 20. financial agency office 13). The step which transfers a premium to the account of said insurance-company office (drawing 20, insurance company 11) said next time is provided.

[0039] Moreover, the machine premium setting approach of this invention is based on the insurance about the machine (drawing 25, machine 9) between a machine user office (drawing 25, machine user 12) and an insurance-company office (drawing 25, insurance company 11). Said machine user office (drawing 25, machine user 12) sets to a financial agency office (drawing 25, financial agency office C17). The step which pays a premium to sets insurance-company office (drawing 25, communication line C17). The step which pays a premium to sets insurance-company office (drawing 25, insurance company 11). Said insurance-company office (drawing 25, insurance company 11) is based on said insurance. The step which acquires the employment information about the employment situation of said machine (drawing 25, machine 9) from said machine user office (drawing 25, machine user 12) through a communication line (drawing 25, communication line A15). Said machine user office (drawing 25, communication line A15). Said machine user office (drawing 25, machine user 12) through a communication line (drawing 25, communication line 129) is based on said insurance. The step which acquires the maintenance information about the maintenance situation of said machine (drawing 25, machine 9) from said machine user office (drawing 25, machine user 12) through a communication line (drawing 25, communication line A15). The step to which said insurance-company office (drawing 25, insurance company 11) is based on said insurance. The step which acquires the employment information about the employment situation of said machine (drawing 25, machine 9) from said machine user office (drawing 25, communication line A15). Said machine user office (drawing 25, machine user 12) and an insurance-company office (drawing 25, insurance company 11) sets to a financial agency office (drawing 25, communication line C17). The step which pays a premium to sets insurance-company office (drawing 25, insurance company 11) determines a premium based on said insurance. said employment information, and said maintenance information, and outputs premium payment directions next time. Said insurance-company office (drawing 25, insurance company 11) is based on premium directions said next time. The step which notifies a premium to said machine user office (drawing 25, machine user 12) through a communication line (drawing 25, communication line D18) said next time. Said machine user office (drawing 25, machine user 12) answers said notice, and sets through a communication line (drawing 25, communication line C17) to said financial agency office (drawing 25, financial agency office 13). The step which transfers a premium to the account of said insurance-company office (drawing 25, insurance company 11) said next time is provided.

[0040] The program for performing the charge setting approach of machine maintenance of this invention for solving the above-mentioned technical problem It is based on the maintenance contract about the machine (drawing 1, machine 9) of a machine user office (drawing 1, machine user 12) and a manufacturer office (drawing 1, machine user 12) and a manufacturer office (drawing 1, manufacturer 28). The step which checks the payment of the charge of maintenance from said machine user office (drawing 1, machine user 12). The charge payment directions of maintenance are answered the next time when it is generated based on the maintenance information about a maintenance situation and said maintenance contract of said machine (drawing 1, machine 9). The step which notifies the charge of maintenance to said machine user office (drawing 1, machine user 12) said next time is performed through a communication line (drawing 1, communication line L32).

[0041] Moreover, the program for performing the charge setting approach of machine maintenance of this invention It is based on the maintenance contract about the machine (drawing 1, machine 9) of a machine user office (drawing 12, machine 9) of a machine user office (drawing 12, machine user 12) and a manufacturer office (drawing 12, 28). The step which checks the payment of the charge of

maintenance from said machine user office (drawing 12. machine user 12). The charge payment directions of maintenance are answered the next time when it is generated based on the employment information about an employment situation. the maintenance information about maintenance information, and said maintenance contract of said machine (drawing 12, machine user 12) said next time is performed through a communication line (drawing 12, machine user 12) said next time is performed through a communication line L32).

[0042] The program for performing the machine premium setting approach of this invention for solving the above-mentioned technical problem It is based on the insurance about the machine (drawing 20, machine 9) of a machine user office (drawing 20, machine user 12) and an insurance-company office (drawing 20, insurance company 11). The step which checks the payment of the premium from said machine user office (drawing 20, machine user 12). Premium payment directions are answered the next time when it is generated based on the maintenance information about an employment situation and said insurance of said machine (drawing 20, machine 9). The step which notifies a premium to said machine user office (drawing 20, machine user 12) said next time is performed through a communication line (drawing 20, communication line D18).

[0043] Furthermore. the program for performing the machine premium setting approach of this invention It is based on the insurance about the machine (drawing 25, machine 9) of a machine user office (drawing 25, machine user 12) and an insurance-company office (drawing 25, insurance company 11). The step which checks the payment of the premium from said machine user office (drawing 25, machine user 12). Premium payment directions are answered the next time when it is generated based on the employment information about an employment situation, the maintenance information about maintenance information, and said insurance of said machine (drawing 25. machine 9). The step which notifies a premium to said machine user office (drawing 25, machine user 12) said next time is performed through a communication line (drawing 25, communication line D18). [0044]

[Embodiment of the Invention] Hereafter, the gestalt of operation of the charge setting system of machine maintenance which is this invention, and a machine premium setting system is explained with reference to an accompanying drawing. In this example, although the machine premium setting system used for a machine user's gas turbine is shown and explained to an example, also in other machines which insurance is concluded and are used in a machine user, it is applicable.

[0045] first, the risk base maintenance (Risk-Based Maintenance) in connection with the machine premium setting system which is this invention — the outline of law (the following — "RBM — law — " — ** — it describes) is explained with reference to drawing 3 and drawing 4. The RBM method is the technique for optimizing the maintenance plan of a machine in the maintenance activities of inspection of a machine, repair, etc. That is, the damage situation of all the components that constitute a machine is grasped periodically first, and a crack initiation situation, a corrosion situation, etc. are investigated. And those damage mechanisms are defined. Next, the life expectancy and breakage probability in a components unit are evaluated from the situation of all current components, and the above-mentioned damage mechanism. And the amount of a loss by breakage of each part article is guessed, and let the breakage probability x amount of a loss be a risk. And it is the risk of the whole machine which all totaled the risk of elegance. Maintenance planned decision which minimizes the above-mentioned risk within the limits of a fixed maintenance cost based on the result of the risk evaluation, and maintenance planned decision from which a maintenance cost serves as the minimum in order to maintain a risk below on criteria are performed. Similarly, in order to maintain the operating ratio beyond criteria. decision of the maintenance plan under which a maintenance cost serves as the minimum is also possible.

[0046] Drawing 4 is a risk matrix which shows the relation between a loss incidence rate and loss. the loss whose axis of abscissa is the amount of a loss — it is — here — expedient — smallness. size, and importance — fatal ** — it is carrying out. however — actual — for

example, 1 million or less yen, 10 million yen or less, 100 million yen or less, and 100 million yen super-****** — it is used according to the machine [like] which is applicable, setting up the parameter which shows the amount of money or loss concretely. An axis of ordinate is a loss incidence rate which is a breakage probability, and is here. **, low, inside, quantity It is carrying out. however — in practice — for example, less than (the same the following which occurs once) 100 years, less than ten years, less than five years, and less than one year as — according to the target machine. it is used concretely, setting up a probability or a similar parameter. Moreover, in each field, a permission good, conditional permission, important point planned modification, and permission are impossible. A risk is ranked and it decides upon a maintenance plan based on it. if inspection and a cure suitable at the time of use good and conditional permission:routine inspection are performing continuously about each rank. for example even if it does not inspect in addition to permission good:routine inspection — continuous — use good and important point planned modification: — permission improper. (a cure: the cure of an improvement of inspection routine. an improvement of operation and a management method. online monitoring, and damage reduction etc.) which copes with by the next check — it is performing said cure immediately etc.

[0047] In drawing 4, loss is small and a loss incidence rate is also permissible in a fine ****** case. If this is checked for every routine inspection, since it does not generate, in a maintenance service. I hear that loss may lower priority and there is. And when there are components whose loss incidence rate other loss is large and is also high, it means that priority should be given there. The time amount spent on maintenance of the maintenance cost concerning maintenance of a machine, repair, etc. for the machine user using a machine is restricted. For the reason, it is very important to give priority to repair of the part or components which are carrying out damage etc. based on risk evaluation like drawing 4. By doing so. maintenance activities which do not generate loss are attained in the limited maintenance cost and time amount. By carrying out by deciding upon the maintenance plan which minimizes such a risk, and going. as shown in drawing 3. as compared with the case where inspection etc. is conducted using the conventional time limits/maintenance check, it becomes possible to aim at reduction of a risk efficiently also with the same inspection and disregard level.

[0048] such [in the charge setting system of machine maintenance and machine premium setting system in this invention] RBM — RBM shown by drawing 3 to the machine user who introduces law and is performing maintenance activities — in view of the effectiveness of law. the approach of discounting the charge of maintenance (below the same in the case of the charge setting system of machine maintenance) and a premium (below the same in the case of a machine premium setting system) is introduced. Reducing the risk of loss by the machine efficiently as a machine user side. and reducing loss leads not only to improvement in the operating ratio of a machine but to reduction of the charge of maintenance. and a premium. Moreover, as an insurance company (in the case of a machine premium setting system, it is below the same) which takes charge of the insurance of the manufacturer (it is below the same in the case of the charge setting system of machine maintenance) who is the manufacturer of a machine, and a machine, the risk [insurance money / (in the case of a machine premium setting system, it is below the same) / the maintenance cost (in the case of the charge setting system of machine maintenance, it is below the same) by the failure of a machine set as the object of maintenance and insurance and] of generating of payment can be reduced. That is, it becomes the premium setting approach which has profits in both a machine user and a manufacturer, or an insurance company.

[0049] next, RBM used for the charge setting system of machine maintenance and machine premium setting system which are this invention — the fundamental view of a setup of the first of the charge of maintenance in consideration of law and a premium is explained with reference to drawing 21, drawing 2, drawing 3 - drawing 4.

[0050] In the charge setting system of this machine maintenance, and a machine premium setting system. it differs from the setting approach of the conventional charge of maintenance. and a premium in that the charge of maintenance (it is below the same in the case of the charge setting system of machine maintenance) and a premium (it is below the same in the case of a

machine premium setting system) are fluctuated according to the maintenance situation of a machine. Although the insurance company (it is below the same in the case of a machine premium setting system) which takes charge of the insurance of the manufacturer (it is below the same in the case of the charge setting system of machine maintenance) who is the manufacturer of a machine, and a machine investigates the maintenance situation of a machine. And it carries out by acquiring the information on a maintenance situation from a machine user. And based on the information, processing by the following charges of maintenance and the premium count process A (**-**) is performed, and a premium is determined.

[0051] ** Calculate the failure rate lambda of a machine first. The failure rate of a machine is calculated by the machine by following several 1 based on failure rate lambdam of a proper, and the use elapsed-years correction factor Ky of a machine. Here, with the maintenance plan based on the RBM method, and the risk reduction by the operation, the failure rate of a proper falls to a machine from the conventional case (lambdamc), and is set to failure rate lambdam at it. That is, it is failure rate lambdam of the conventional failure rate lambdamc)RBM method (however, a maintenance plan etc. is appropriate, and when there is nothing, there may also be a case of lambda mc<lambda m). In this case, failure rate lambdam of the RBM method is the information about modification of the charge of maintenance, and a premium. Thereby, lambda also becomes low compared with the conventional case.

[Equation 1]

$$\lambda = Ky \cdot \lambda\, m$$

However, the relation between use elapsed years and the use elapsed-years correction factor Ky is shown in drawing 16. An axis of abscissa is use elapsed years (year), and an axis of ordinate is the use elapsed-years correction factor Ky. The time of intact is set to 1.0. use elapsed years take for increasing, and Ky goes up. namely, it is shown that a failure incidence rate goes up.

** Next, compute repair time amount T. The repair time amount T which is the time amount from failure generating to the completion of failure part repair is calculated by following several 2 based on the time amount Td which detection takes, and the time amount Tr which restoration of failure of a machine takes from failure generating of a machine.

[Equation 2]

$$T = T\,d + T\,r$$

Moreover, recoverability mu is calculated by following several 3 using the repair time amount T.

[Equation 3]

$$\mu = 1 / T$$

However, when the remote monitor of the machine is always carried out, the occurrence of accident can be detected extremely in a short time. Therefore, Td becomes very short and can be disregarded to Tr. That is, it is possible to shorten the repair time amount T. It turns out that it leads to improvement in recoverability mu.

** Next, compute the operating ratio forecast A. The operating ratio forecast A of the machine in consideration of the above-mentioned failure rate is computed by following several 4 based on the failure rate lambda computed by **, and the recoverability mu computed by **.

[Equation 4]

$$\lambda = \mu / (\lambda + \mu)$$

** And calculate the amount of a loss D. The loss by failure of a machine is computed by following several 5 based on loss **** kg peculiar to the machine showing the amount of a loss per 1% of operating ratios, and the operating ratio forecast A computed by **.

[Equation 5]

$$D = K\,g\ (1 - A)$$

In drawing 2 and drawing 21, the relation of the amount of a loss D and the operating ratio forecast A by failure of a machine is shown. An axis of abscissa is operating ratio forecast A (%),

and an axis of ordinate is the amount of a loss D. In the case of 100% of operating ratio forecasts, although it becomes the amount of a loss D= 0, the operating ratio forecast A takes for falling, and increases the amount of a loss D. Moreover, the amount of a loss D which it is as a result of the above-mentioned count in consideration of the RBM method is a low value as compared with the amount of a loss DC by the conventional approach (what is several 1 and used lambdamc for the machine as a failure rate of a proper). That is, since the RBM method is adopted, the failure incidence rate lambda falls and the amount of a loss is falling (D<DC).

[0052] ** Perform calculation of the next charge E of maintenance (in the case of the charge setting system of machine maintenance, it is below the same), and Premium C (in the case of a machine premium setting system, it is below the same) based on the above-mentioned result. Calculation of the charge of maintenance of the next time of a machine and a premium is determined based on the amount of a loss D for which it asked by **. In drawing 2 and drawing 21, the relation between the amount of a loss DC calculated by the conventional approach of a machine, the charge EC of maintenance and Premium CC, the amount of a loss D calculated by this invention, the charge E of maintenance and Premium C, and the operating ratio forecast A is shown. An axis of abscissa is operating ratio forecast A (%), and axes of ordinate are this invention, the conventional premium, and the amount of a loss.

[0053] Since the charge E of maintenance consists of the costs (= amount of a loss D) concerning maintenance, and the maintenance cost (e> 0) which is the cost for the management of a maintenance enterprise in principle, it becomes like the graph of the charge E of maintenance shown in drawing 2. Moreover, in principle, since Premium C consists of the net premium (= amount of a loss D) which is the cost for insurance money payment, and the loading (d> 0) which is the cost for insurance enterprise management, it becomes like the graph of Premium C shown in drawing 21. Here, since a risk reduces the machine which has a suitable maintenance plan based on the RBM method and by which maintenance is carried out based on it as shown in drawing 3, it becomes low as compared with the amount of a loss DC (what is several 1 and used lambdamc for the machine as a failure rate of a proper) which the amount of a loss D calculated based on a loss D calculated by the conventional approach. Therefore, the premium calculated based on the amount of a loss will be set up at a low price. That is, to the same operating ratio forecast A, the charge E of maintenance by the charge setting system of machine maintenance which is this invention, and the premium C by the machine premium setting system make it low compared with the charge EC of maintenance by the conventional approach, and Premium CC (EC>E, CC>C). and as a difference is among both, it is set up.

[0054] It is targeted at the machine user who is performing planning and implementation of a maintenance plan by the RBM method in this invention. And the decrement of the charge of maintenance by failure rate lambdam of a proper falling to a machine and a premium becomes high, and a setup of the charge of maintenance and a premium becomes cheaper, so that it is carrying out appropriately [the RBM method] and effectively. such an incentive -- a machine user's RBM -- suitable operation after the increment in the introductory volition of law and installation is achieved. This can be said to both a manufacturer or an insurance company, and a machine user that it is the charge setting system of maintenance and a premium setting system with profits as mentioned above.

[0055] moreover, lambdam -- the same -- Ky -- RBM -- it is also possible to set up so that it may become low by installation of law. That is, in drawing 16, at the time of intact, although it is Ky=1.0, it sets up so that the rate of a rise of Ky accompanying the increment in use elapsed years may be lessened. By doing so, the same effectiveness as a setup which lambdam reduces is acquired.

[0056] In addition, the graph which shows the charge E of maintenance of drawing 2 and the premium C of drawing 21, and relation with the operating ratio forecast A is not necessarily limited to five by the range of the value of the operating ratio forecast A, although the charge E of maintenance and Premium C take five values. The charge of maintenance = (a) Carry out a principle [the costs (= amount of a loss) + maintenance cost and the premium = net premium (= amount of a loss) + loading concerning maintenance]. (b) If the charge of maintenance and premium at the time are set to S2, the charge of maintenance and premium at the time

[A=A /1 / which takes the value of the highest charge of maintenance, and a premium when A is 0%, and serves as the minimum charge of maintenance, and a premium when A is 100%/(c)]
[A=A /2 / S1 and] What is necessary is to just be determined at the time of A1<A2, so that two conditions of ** used as S1 >=S2 may be fulfilled. The conditions of (b) have the high possibility of failure of a machine, and the prediction operating ratio A is based on the principle of becoming the highest charge of maintenance, and a premium when close to 0%, and becoming the minimum charge of maintenance, and a premium if 100% of prediction availability is expected.
It is based on whether the charge of maintenance and a premium are so the same that the conditions of (c) have the low prediction operating ratio A, and the principle of becoming high. And the graph which fulfills the conditions of (a) – (c) is set up with the model of machine, magnitude, etc.

[0057] It is the fundamental view of a setup of the first of the charge setting system of machine maintenance, and a machine premium setting system to use the decision approach of of the charge of maintenance and premium using the above RBM methods.

[0058] Next, the fundamental view of a setup of the second of the charge of maintenance used for the machine premium setting system and machine premium setting system which are this invention, and a premium is explained with reference to drawing 13 – drawing 15, drawing 27, and drawing 19. In this machine premium setting system and a machine premium setting system, it differs from the setting approach of the conventional charge of maintenance, and a premium in that the charge of maintenance (it is below the same in the case of the charge setting system of a machine maintenance) and a premium (it is below the same in the case of a machine premium setting system) are fluctuated according to the usual employment situation and the usual above-mentioned maintenance situation of a machine. Although the insurance company (it is below the same in the case of a machine premium setting system) which takes charge of the insurance of the manufacturer (it is below the same in the case of the charge setting system of machine maintenance) who is the manufacturer of a machine, and a machine investigates the employment situation of the usually of a machine, the output at the time of the employment in a machine, the count of start and stop, and the output rate of change per unit time amount are used as an item of an employment situation. Moreover, although the maintenance situation of a machine is investigated, the information on maintenance situations, such as risk-evaluation information on elegance, maintenance plan information, and reevaluation risk information, is all used about a machine. About each information, the machine user who uses a machine from a manufacturer and an insurance company is asked, and data are collected. And processing by the following charges of maintenance and the premium count process B ((1) – (9)) is performed, and the final charge EE of maintenance and Premium CE are determined.

[0059] First, the failure rate lambda in consideration of the employment actual condition for making an employment situation reflect in the charge of maintenance and a premium is calculated.
(1) Compute the output correction factor Kp first. Kp is a multiplier which makes the output at the time of employment of a machine reflect in a failure rate. Drawing 13 shows the relation between the output of a device facility (gas turbine). and a correction factor Kp. An axis of abscissa is the output (%) of a gas turbine, and is the value standardized with the horsepower output. An axis of ordinate is the output correction factor Kp for failure rate calculation. Output output. When an output is
= it is correction factor =1 (with no amendment) at the time of rated value. When an output is lower than rated value, Kp has become less than 1.0 and shows possibility that a failure rate will become lower than the case of employment with rated value. When an output is larger than rated value (equivalent to the rated value in drawing 6), Kp is large rather than 1.0 and shows possibility that a failure rate will become higher than the case of employment with rated value. The decision of Kp detects the horsepower output value within the period (for example, one month) set up beforehand, and is performed by computing from the relation of the output and correction factor Kp which show the value of Kp in the output value by drawing 13.

[0060] (2) Next, compute the count correction factor Ks of start and stop. Ks is a multiplier which makes the count of start and stop at the time of employment of a machine reflect in a failure rate. Drawing 14 shows the relation between the count of start and stop of a device

facility (gas turbine), and a correction factor Ks. An axis of abscissa is the count of start and stop of a gas turbine (the count of starting and a halt, a time/period). and an axis of ordinate is the count correction factor Ks of start and stop for failure rate calculation. The count of start and stop = it is correction factor =1 (with no amendment) at the time of a design-basis value. When the count of start and stop is lower than a design-basis value (equivalent to the design upper limit in drawing 7). Ks has become less than 1.0 and shows possibility that a failure rate will become lower than the case of employment with a design-basis value. When the count of start and stop is larger than a design-basis value, Ks is large rather than 1.0 and shows possibility that a failure rate will become higher than the case of employment with a design-basis value. The decision of Ks detects the count of start and stop within the period set up beforehand, and is performed by computing from the relation of the count of start and stop and correction factor Ks which show the value of Ks in the count of start and stop by drawing 14.

[0061] (3) Next, compute the output rate-of-change correction factor Kr. Kr is a multiplier which makes the output rate of change at the time of employment of a machine reflect in a failure rate. Drawing 15 shows the relation between the output rate of change of a device facility (gas turbine), and a correction factor Kr. An axis of abscissa is the output rate of change (change of the output of per unit time amount (for example, time amount) comparatively %) of a gas turbine. An axis of ordinate is the output rate-of-change correction factor Kr for failure rate calculation. Output rate of change = it is correction factor =1 (with no amendment) at the time of a design-basis value. When output rate of change is lower than a design-basis value (equivalent to the design upper limit in drawing 8). Kr has become less than 1.0 and shows possibility that a failure rate will become lower than the case of employment with a design-basis value. When the count of start and stop is larger than a design-basis value, Kr is large rather than 1.0 and shows possibility that a failure rate will become higher than the case of employment with a design-basis value. The decision of Kr detects the horsepower output rate of change within the period set up beforehand, and is performed by computing from the relation of the output rate of change and correction factor Kr which show the value of Kr in the output rate of change by drawing 15.

[0062] (4) Calculate the failure rate lambda of a machine. The failure rate of a machine (gas turbine) is calculated by following several 6 based on the three above-mentioned correction factors (the output correction factor Kp, the count correction factor Ks of start and stop, output rate-of-change correction factor Kr). and the multiplier a (the difference of the numeric value of an actual failure rate and lambda is amended) beforehand set up by the machine with failure rate lambdam of a proper, and the use elapsed-years correction factor Ky (drawing 16) of a machine.
[Equation 6]
$$\lambda = \alpha \cdot Ky \cdot Kp \cdot Ks \cdot Kr \cdot \lambda m$$

That is, this failure rate lambda has considered failure rate lambdam of a device facility proper, and not only use elapsed years (use elapsed-years correction factor Ky) but the employment situation of a device facility, and is the failure rate which reflected the employment actual condition correctly. However, the relation between use elapsed years and the use elapsed-years correction factor Ky is shown in drawing 16. An axis of abscissa is use elapsed years (year). and an axis of ordinate is the use elapsed-years correction factor Ky. The time of intact is set to 1.0. use elapsed years take for increasing, and Ky goes up. namely, it is shown that a failure incidence rate goes up.

[0063] Next, the charge E of temporary maintenance and the charge EE of maintenance, the temporary premium C, and Premium CE are calculated using the failure rate lambda which reflected the employment actual condition correctly.
(5) Compute repair time amount T first. The repair time amount T which is the time amount from failure generating to the completion of failure part repair is calculated by following several 7 based on the time amount Td which detection takes, and the time amount Tr which restoration of failure of a machine takes from failure generating of a machine (gas turbine).
[Equation 7]
$$T = T d + T r$$

Premium C shown in drawing 27. namely. premium = net premium (= amount of a loss) + loading it is .

[0068] Here, since a risk will decrease if the employment situation of a machine is the good employment which observed rated value and a design upper limit, the amount of a loss D becomes low as compared with the amount of a loss DC calculated by the conventional approach. Therefore, the charge of maintenance and premium which are calculated based on the amount of a loss will be set up at a low price. That is, to the same operating ratio forecast A. the charge E of maintenance by the charge setting system of machine maintenance which is this invention, and the premium C by the machine premium setting system are made low compared with the charge EC of maintenance by the conventional approach, and Premium CC (EC>E. CC>C). and as a difference is among both. it is set up.

[0069] (9) on the other hand — an employment situation — being good — in addition — and a machine — receiving — RBM — based on law, it has a suitable maintenance plan. and consider the case where maintenance is carried out proper based on it. When it has a suitable maintenance plan based on the RBM method and maintenance is carried out proper based on it, as shown by drawing 3, the risk by failure of a machine decreases. Therefore. failure rate lambdam of a proper will fall to a device facility at such a case. In order to make it reflect, lambdam used in several 6 of (4) is changed based on the failure rate (referred to as lambdamc) of the original proper, the information on a maintenance situation, etc.. and failure rate lambdam is decreased in suitable magnitude. And lambda is calculated by changed lambdam and the amount of a loss (referred to as DE) is calculated with several 7 - a-ten number using the lambda. It will be set to DE shown by drawing 27 and drawing 19 if it does so. That is, as compared with the amount of a loss D when the amount of a loss DE in the case of enforcing the RBM method further takes only an employment situation into consideration, it is decreasing further. Therefore, the charge of maintenance and premium which are calculated based on the amount of a loss will be set up at a low price. namely, the same operating ratio forecast A — receiving — RBM — it makes low compared with the charge E of maintenance as which the charge EE of maintenance by the charge setting system of machine maintenance and the machine premium setting system which determines the charge of maintenance and a premium using the maintenance-information + employment information on law, and which is this invention, and Premium CE are determined using the charge EC of maintenance by the conventional approach, Premium CC, and employment information, and a premium C (EC>EE. CC>CE). and it is set up as there is a difference.

[0070] this invention — setting — the employment situation of a machine — indicating — and RBM — it is targeted at the machine user who is performing planning and implementation of a maintenance plan by law. and an employment situation — being good — RBM — when suitable and effective operation of law is made. discount of the charge of maintenance and a premium to the machine user is made [many]. and the charge of maintenance and a premium are set up so that it may become cheaper. such an incentive — an improvement of a machine user's employment approach, and RBM — suitable operation after the improvement in the introductory track record of law and installation is achieved. This can be said to both a manufacturer and an insurance company, and a machine user that it is the charge of maintenance and a premium setting system with profits as mentioned above. moreover, lambdam — the same — Ky — RBM — it is also possible to set up so that it may become low by installation of law. That is, in drawing 16, at the time of intact, although it is Ky=1.0, it sets up so that the rate of a rise of Ky accompanying the increment in use elapsed years may be lessened. By doing so, the same effectiveness as a setup which lambdam reduces is acquired.

[0071] In addition, the graph which shows the relation between the charge EE of maintenance of drawing 27 and drawing 19 and Premium CE, and the operating ratio forecast A is not necessarily limited to five by the range of the value of the operating ratio forecast A, although the charge EE of maintenance and Premium CE take five values. Maintenance **** = (a) Carry out a principle [maintenance-cost (= amount of a loss) + maintenance cost and a premium = net premium (= amount of a loss) + loading]. (b) When A is 0%. take the value of the highest charge of maintenance, and a premium, and when A is 100%. become the minimum charge of maintenance.

Moreover, recoverability mu is calculated by following several 8 using the repair time amount T.

[Equation 8]

$$\mu = 1 / T$$

That is, not only Tr but the value of Td cannot usually be disregarded as repair time amount T. However, a machine can detect extremely the occurrence of **** which is always performing the remote monitor, and accident in a short time. Therefore. Td becomes very short and can be disregarded to Tr. That is, it is possible to shorten the repair time amount T. It turns out that it leads to improvement in recoverability mu.

[0064] (6) Next, compute the operating ratio forecast A. The operating ratio forecast A of the machine in consideration of the above-mentioned failure rate is computed by following several 9 based on the failure rate lambda computed by (4), and the recoverability mu computed by (5).

[Equation 9]

$$A = \mu / (\lambda + \mu)$$

That is, the operating ratio forecast A is a value reflecting the failure rate lambda which reflected the employment situation of a machine correctly. That is, it turns out that the operating ratio anticipation which reflected the employment actual condition of a machine in accuracy more is made.

[0065] (7) Next, calculate the amount of a loss D. The loss by failure of a machine is computed by following several 10 based on loss **** kg peculiar to the machine showing the amount of a loss per 1% of operating ratios, and the operating ratio forecast A computed by (6).

[Equation 10]

$$D = K g \cdot (1 - A)$$

In drawing 27 and drawing 19, the relation of the amount of a loss D and the operating ratio forecast A by failure of a machine 9 is shown. An axis of abscissa is operating ratio forecast A (%). and an axis of ordinate is the amount of a loss D. In the case of 100% of operating ratio forecasts, although it becomes the amount of a loss D= 0. the operating ratio forecast A takes for falling, and increases the amount of a loss D. Moreover, the amount of a loss D which it is as a result of the above-mentioned count which reflected the employment actual condition of a machine in accuracy more is a low value as compared with the amount of a loss DC by the conventional approach (it is several 6 and Kp. Ks, and Kr are not taken into consideration). That is, since the information on the employment situation of a machine is made to reflect, the failure incidence rate lambda falls and the amount of a loss is falling (D<DC).

[0066] (8) Perform calculation of the next charge E of maintenance (in the case of the charge E of maintenance by the charge setting system of machine maintenance, it is below the same). and Premium C (in the case of a setting system of machine maintenance, it is below the same) based on the above-mentioned result. Calculation of the charge of maintenance of the next time of a machine and a premium is determined by the relation of the charge E of maintenance and Premium C, and the operating ratio forecast A which were set up based on the amount of a loss D for which it asked by (7).

[0067] In drawing 27 and drawing 19, the relation between the amount of a loss DC calculated by the conventional approach of a machine. the charge EC of maintenance and Premium CC, the amount of a loss D calculated by the approach in which the information on the above-mentioned charge E of maintenance and Premium C, and employment situation was made to reflect and the charge E of maintenance and Premium C, and the operating ratio forecast A is shown. An axis of abscissa is operating ratio forecast A (%). and axes of ordinate are this invention, the conventional premium, and the amount of a loss. Since the charge E of maintenance consists of the maintenance cost (= amount of a loss D) which is the costs concerning maintenance, and the maintenance cost (e> 0) which is the cost for the management of a maintenance enterprise in principle, it becomes like the graph of the charge E of maintenance shown in drawing 19. namely, maintenance **** = maintenance-cost (= amount of a loss) + maintenance cost it is . Moreover, since Premium C consists of the net premium (= amount of a loss) + maintenance cost and the loading (d> 0) which is the cost for insurance money payment, and the loading (d> 0) which amount of a loss D) which is the cost for insurance enterprise management in principle, it becomes like the graph of

and a premium. (c) What is necessary is to just be determined at the time of A1<A2 so that two conditions of ** used as S1 >=S2 may be fulfilled if the charge of maintenance and premium at the time are set to S2 for the charge of maintenance and premium at the time. [A=A/1 / operating ratio forecast] [A=A /2 / S1 and / operating ratio forecast] It is based on the principle of the possibility of failure of a machine serves as the highest charge of maintenance. and a premium highly [the conditions of (b)] when close to 0%. and the operating ratio forecast A will serve as the minimum charge of maintenance, and a premium if 100% of operating ratio forecasts is expected. It is based on whether the charge of maintenance and a premium are so the same that the conditions of (c) have the low operating ratio forecast A, and the principle of becoming high. And the graph which fulfills the conditions of (a) - (c) is set up with the model of machine. magnitude, etc.

[0072] Since the increment in the failure incidence rate by use elapsed years is reflected in a failure rate by Ky, there is not necessarily no need that use elapsed years take into consideration in the data (equivalent to the graph of drawing 13 – drawing 15) which calculate Kp, Ks. and Kr. However, depending on the class of machine, there is more sensitive possibility about one or more items of an output, the count of start and stop. and the output rate of change by elapsed years. When it is known beforehand, or when it becomes clear by the middle, it is possible to also make it change about the data which calculate a corresponding correction factor (Kp, Ks, Kr) based on elapsed years. Moreover, when it deviates from the rated value of an output, and the design-basis value of the count of start and stop. and output rate of change remarkably, it is also possible to use the data of the correction factor (Kp, Ks, Kr) of another sequence. For example, a correction factor is made to increase like one premium, two premiums. and three premiums according to extent of deviation. Moreover, conversely, when extent of deviation is very few. it is also possible to decrease carry out a little correction factor according to extent of deviation, and to make it the criteria of amendment not become severe too much.

[0073] the employment situation of the above machines -- taking into consideration -- and RBM -- it is the fundamental view of a setup of the second of the charge setting system of machine maintenance, and a machine premium setting system to use the decision approach of the charge of maintenance and premium using law.

[0074] (An example 1) explains the configuration of the first of the gestalt of operation of the charge setting system of machine maintenance which is this invention with reference to drawing. In this example, the fundamental view of a setup of the first of the charge setting system of machine maintenance and a machine premium setting system is used. Drawing 1 is a block diagram about the gestalt of operation of the first of the charge setting system of machine maintenance which is this invention. and possesses the manufacturer 28 as a manufacturer office. the machine user 12 as a machine user office, the financial agency office 13, a communication line I29. a communication line L32, a communication line K31, and a communication line J30. A manufacturer 28 possesses the maintenance evaluation system B33 as a maintenance evaluation server equipped with the maintenance evaluation server B35 as a maintenance evaluation server, and the maintenance evaluation information database B36 as a maintenance evaluation information database. and the costs managerial system 34 equipped with the costs management server 37 and the cost-information database 38. Moreover, the machine user 12 possesses the facility operations system 3 and the accounting server 14 having the maintenance server 8, a machine 9, and the maintenance database 10.

[0075] Usually, on the occasion of the purchase of a machine 9, the machine user 12 concludes the maintenance contract for maintenance of a manufacturer 28 and a machine 9. And the charge of maintenance for every (every [for example.] turnaround of a machine 9) period of a certain is determined. and the machine user 12 pays the charge of maintenance for every period of the to a manufacturer 28. the facility operations system 3 which. on the other hand, has the machine user's 12 machine 9 -- RBM of a machine 9 -- the information (correspondence situations over the damage at the time of damage situations, such as each part article of a machine 9, a risk-evaluation result, and a turnaround etc., such as repair and exchange, future maintenance plan. etc.) about the maintenance based on law is held. A manufacturer's 28 maintenance evaluation system B33 acquires the above-mentioned information on the period

(every [for example,] turnaround of a machine 9) set up beforehand, and analyzes the information on the maintenance in the period. And based on the result of analysis. a manufacturer 28 determines the charge of maintenance the next time which is a charge of maintenance in the next period, and decides to notify a machine user. Since this process is performed for every period defined beforehand, it performs measurement of a maintenance situation, and count of the charge of maintenance again at the next period.

[0076] the charge of next maintenance -- the maintenance situation and maintenance plan of a machine 9 -- RBM -- it is set up so that it is carried out based on law. and it may become cheaper than the conventional charge of maintenance, if good. Thereby. if the measure of maintenance of a machine 9 is performed appropriately, the machine user 12 can reduce expenses of the charge of maintenance, and capacity utilization rate will also improve. Since a manufacturer 28 can also fall the failure incidence rate of a machine 9. when a machine 9 breaks down, expenses of the maintenance cost for repairing a machine 9 can be reduced. Therefore, it becomes the charge setting approach of maintenance of bringing the both sides of the device facility user 12 and a manufacturer 28 profits.

[0077] Next, the configuration of each part is explained below at a detail. First, the manufacturer 28 as a manufacturer station is explained. The maintenance evaluation system B33 as a maintenance evaluation system is equipped with the maintenance evaluation server B35 and the maintenance evaluation information database B36. It is possible for there to be no need that these are not necessarily exclusively for the machine user's 12 facility operations system 3. and to deal with it also about the information on other machine users' facility operations system (not shown). The maintenance server 8 of the machine user's 12 facility operations system 3 and a communication link are possible for the maintenance evaluation server B35 as a maintenance evaluation server through a communication line I29. And the information about the maintenance situation in the facility operations system 3 is analyzed about reception and those information to every [which was set up beforehand] period (for example, turnaround of a machine 9). The charge of maintenance in the period when the degree of the facility operations system 3 was beforehand set up with it based on the result is set up. The information about the set-up charge of maintenance is outputted to the costs managerial system 34 as charge payment directions of maintenance. Moreover, the received information and the information about the set-up charge of maintenance are saved in the maintenance evaluation information database B36. In addition, the information about a maintenance situation can also be acquired by requiring of the maintenance server 8 if needed.

[0078] The maintenance evaluation information database B36 as a maintenance evaluation information database is connected to a maintenance evaluation server B35, and the information about the maintenance situation of the machine 9 which the maintenance evaluation server B35 acquired, the information about the maintenance plan sent to a manufacturer 28 based on the maintenance contract between a manufacturer 28 and the machine user 12, information required for a setup of the charge of maintenance, the information about the set-up charge of maintenance, etc. hold. And according to a demand of the maintenance evaluation server B35. drawing is possible for those information always.

[0079] The costs managerial system 34 possesses the costs management server 37 and the cost-information database 38. There is no need that these are not necessarily exclusively for the maintenance evaluation system B33, and the combination with other maintenance evaluation systems (not shown) and a process [need / other maintenance / to be managed] is also possible for it. Moreover. it is possible for there to be no need of being exclusively for the machine user's 12 facility operations system 3, and to deal with it also about the maintenance control of other machine users' machine (not shown). Moreover, the costs managerial system 34 is managed by the section [handling / the section / costs, such as accounting or an accounting section different from the maintenance evaluation system B33,].

[0080] The costs management server 37 is a server linked to the maintenance evaluation server B35. And procedure about the reception of the charge of maintenance from the machine user 12 is performed, and also the information (charge payment directions of maintenance) about the charge of maintenance which the maintenance evaluation server B35 set up is answered, and

procedure about the charge of maintenance is performed based on the contents of a contract held at the information and the cost-information database 38.

[0081] The cost-information database 38 is connected with the costs management server 37. And the information about the charge of maintenance set up to said machine user's 12 machine 3, the information about the charge procedure of maintenance, and the information about a runner continuation of the various costs set up based on the maintenance contract are held. According to a demand of the costs management server 37, drawing is possible for those information always.

[0082] A communication line I29 is a communication line which connects a manufacturer 28 and the machine user 12. They are a public line, the Internet circuit, or a dedicated line. Moreover, it is also possible to carry out by the communication link by wireless. It uses for the communication link of the information about maintenance by the maintenance evaluation system B33 and the facility operations system 3.

[0083] Next, the machine user 12 as a machine user station is explained. The facility operations system 3 possesses the maintenance server 8, a machine 9, and the maintenance database 10. And it has managed about maintenance of a machine 9. It connects with a machine 9 and the maintenance database 10, and the maintenance server 8 performs management about maintenance of a machine 9 while connecting with the maintenance evaluation server B35 of the maintenance evaluation system B33. With it, the data about the maintenance situation of a machine 9 or the facility operations system 3, and periodical in data concerning an employment situation according to a demand of a manufacturer's 28 maintenance evaluation server B35 -- or it transmits suitably.

[0084] A machine 9 is the machine body and peripheral device which connect with the maintenance server 8 and are employed by the machine users 12, such as a gas turbine, and a boiler, a generator, and which are working in fact. In this example, it is a gas turbine.

[0085] The maintenance database 10 is connected to the maintenance server 8, and the maintenance server 8 holds the data about the employment situation of the machine 9 acquired from the exterior of a machine 9 or the facility operations system 3 inside.

[0086] The accounting server 14 is an accounting-related server which the machine user 12 has and is connected with the financial agency station 13 through the communication line K31. The charge of maintenance to a manufacturer 28 pays, and procedure relevant to it etc. is performed. It is managed by the section [handling / the section / costs, such as accounting or an accounting section.]. Moreover, it has connected with a manufacturer's 28 costs managerial system 34 by the communication line L32.

[0087] A communication line J30 is a communication line which connects the financial agency station 13 to a manufacturer 28. They are a public line, the Internet circuit, or a dedicated line. Moreover, it is also possible to carry out by the communication link by wireless. It uses for the communication link for the electronic commerce of a manufacturer 28 and the financial agency station 13.

[0088] A communication line K31 is a communication line which connects the financial agency station 13 to the machine user 12. They are a public line, the Internet circuit, or a dedicated line. Moreover, it is also possible to carry out by the communication link by wireless. It uses for the communication link for the electronic commerce of the machine user 12 and the financial agency station 13.

[0089] A communication line L32 is a communication line which connects a manufacturer 28 and the machine user 12. They are the Internet circuit or a dedicated line. Moreover, it is also possible to carry out by the communication link by wireless. It uses for the communication link for the communication link of the maintenance-related information of a manufacturer 28 and the machine user 12, electronic commerce, etc.

[0090] the financial agency station 13 comes out of a bank, various finance business shrines, etc. which have business connections with a manufacturer 28 and the machine user 12. It can have a server (not shown) and the account for dealings of a manufacturer 28 and the machine user 12 can be opened. And when delivering and receiving various costs, such as electronic commerce,

change processing, etc. in which the manufacturer 28 and the machine user 12 used the communication line, the financial agency station 13 performs processing which mediates dealings.

[0091] Actuation of the gestalt of operation of the first of the charge setting system of machine maintenance which is this invention is explained to a detail using drawing 1, drawing 2, drawing 4 – drawing 5. With reference to drawing 1 and drawing 5, drawing 5 shows the process flow of the charge (and premium) decision of maintenance among actuation of the charge setting system of machine maintenance which is this invention. First, in the phase before initiation (S101), the manufacturer 28 and the machine user 12 are performing the maintenance contract about the charge setting system of machine maintenance of this invention. the inside of it -- RBM of the machines 9, such as relation (equivalent to drawing 2) between the setting period (the charge count of maintenance and the maintenance horizon which are set up beforehand) of the charge of maintenance, the charge count approach of maintenance (the above-mentioned charge (and premium) count process of maintenance A**-**), and the operating ratio of Machine A and the charge of maintenance. -- the contract about the maintenance planned decision which applied law is also included. Moreover, the machine user's 28 maintenance evaluation system B33 is connected with a manufacturer's 28 maintenance evaluation system B33 by the communication line I29 by the contract about information acquisition of the maintenance situation in the facility operations system 3 in a maintenance contract. And the maintenance evaluation system B33 can acquire now the data of the facility operations system 3 through a communication line I29 by the demand.

[0092] The maintenance evaluation server B35 acquires the information about a maintenance situation from the facility operations system 3 after the beginning of mission of a machine 9 (gas turbine) for every (in this example, it carries out to every turnaround of a gas turbine, and may be two years) period set up beforehand (drawing 5, S102). The information about a maintenance situation is the following information. the turnaround of a gas turbine -- RBM -- risk evaluation of the machine 9 by law is performed. That is, the damage situation of all the components that constitute a gas turbine is grasped periodically, and the loss incidence rate which is a probability for the life expectancy in a components unit and breakage to arise from a crack initiation situation, a corrosion situation, etc. is evaluated. Next, the loss which is the amount of a loss by breakage of each part article is guessed, and the risk information on each components which make a risk loss incidence-rate (breakage probability) x loss (amount of a loss) is generated (what performed information illustrated by drawing 4 with each components). And based on the result of the risk evaluation of elegance, it all decides upon the maintenance plan which minimizes the above-mentioned risk within the limits of a fixed maintenance cost. By the maintenance plan, that permission is possible by routine inspection next time, or in order to check whether it shifts to conditional permission C, important point planned modification reevaluates a risk to that permission of the permission failure in drawing 4 is possible, or conditional permission C, and generates reevaluation risk information to it again. By reevaluation of a risk, when a problem is lost, a turnaround is completed. The information about the maintenance situation which the maintenance evaluation server B35 receives from the facility operations system 3 is the above-mentioned risk-evaluation information, a maintenance plan, and risk reevaluation information. The acquired information is memorized in the maintenance evaluation information database B36.

[0093] In addition, since the RBA method is performed not only at the case of routine inspection but at the time at the time of other check, the maintenance evaluation server B35 acquires the information about a maintenance situation from the facility operations system 3 if needed (the charge amendment activity of maintenance shown in this example is suitably done in that case if needed).

[0094] Next, based on those data, the maintenance evaluation server B35 evaluates a maintenance situation (S103). evaluation -- (I) -- or each part article is all in the condition of a permission good, conditional permission good, important point planned modification, and permission improper throat by the risk evaluation of elegance -- (II) -- as a result of processing of the maintenance service to the risk evaluation (I) of elegance, a maintenance plan, etc. all

performing risk reevaluation, or the risk fell how far ******** -- it carries out based on the matrix of the risk illustrated by drawing 4. and the information as a result of the risk reevaluation -- being based -- RBM -- the comparison with the failure incidence rate (general approach) by the usual maintenance which does not use law determines the amount of falls of the failure rate of the proper of a gas turbine. Based on the amount of falls, failure rate lambdam of the proper of a new gas turbine is computed. The amount of falls of failure rate lambdam is set up so that a risk becomes small. and it may become large. In addition, the failure rate of a gas turbine proper which was computed. In addition, the failure rate of a gas turbine proper is held in the maintenance evaluation information database B36. However, it is also possible to set up using the contents of the maintenance information in connection with other RBM methods, so that the charge of maintenance may be discounted.

[0095] It continues, and the maintenance evaluation server B35 computes the charge E of maintenance, after [****] all performing evaluation of the risk of elegance, calculation of failure rate lambdam of the proper of a gas turbine, etc. (S104). That is, the maintenance evaluation server B35 first acquires the use elapsed-years correction factor Ky currently held in the maintenance evaluation information database B36. the release time Tr at the time of failure, and the detection time amount Td (forecast) of failure. Based on lambda m which was obtained and which was K(ied) and computed. the failure rate lambda of a gas turbine is computed by several 1:lambda=Ky-lambda m of the above-mentioned charge (and premium) count process of maintenance **. Next. it is the repair time amount T which must stop a gas turbine for repair etc. when failure occurs Number 2:T=Td+Tr of the above-mentioned charge (and premium) count process of maintenance ** It computes. However. time amount, Tr which detection takes from Td:failure generating: It is the time amount which restoration of failure takes.

[0096] next. the operating ratio forecast A which is a forecast of the operating ratio to the next turnaround of a gas turbine -- several [of the above-mentioned charge (and premium) count process of maintenance **] -- it computes by 4:A=mu/(lambda+mu). however. the recoverability mu -- several -- 3:mu=1/T it is . Based on the value of the calculated operating ratio forecast A, the charge E of maintenance of the next period is computed by the process of the above-mentioned charge (and premium) count process of maintenance **, and **.

[0097] Based on the maintenance contract of the machine user 12 and a manufacturer 28, the charge E of maintenance is determined as mentioned above by the information interchange about the maintenance situation between a gas turbine and the maintenance evaluation system B33. The information is held at the maintenance evaluation information database B36. And based on the charge E of maintenance, the maintenance evaluation server B35 outputs the charge payment directions of maintenance to the costs management server 37 of the costs managerial system 34 (S105), and processing of the charge decision of maintenance ends him (S106).

[0098] The costs management server 37 sends the notice of the charge payment request of maintenance of degree batch by the method of payment set up based on the contract of a manufacturer 28 and the machine user 12 through a communication line L32 to the machine user's 12 accounting server 14. The accounting server 14 answers the notice and pays the charge of maintenance of degree batch to a manufacturer 28. As a method of payment, it pays about a payment period according to contracts, such as payment for every year. and payment for every turnaround. Moreover, a manufacturer 28. the machine user 12, and three persons of the financial agency station 13 exchange contracts of electronic commerce of having used the communication line in advance. and are made to run in the electronic procedure in the financial agency station 13 about sending of the charge of maintenance easily based on it. For example, a manufacturer 28 and the machine user 12 establish an account to both the financial agency stations 13. And using a communication line K31. the machine user's 12 accounting server 14 takes out payment directions to the financial agency station 13. and transfers the charge of maintenance to the account of a manufacturer's 28 financial agency station. The financial agency station 13 notifies the machine user 12 costs management server 37 of payment information through a communication line J30.

[0099] Performing the above actuation every two years which are spacing of the turnaround of the gas turbine beforehand set up by the maintenance contract, the machine user 12 pays the charge of maintenance to a manufacturer 28. It continues in the maintenance time based on a

maintenance contract, and payment of this charge of maintenance is performed. However. changing about a period by a contract etc. is possible.

[0100] By actuation of the above this invention, a setup of the charge of maintenance with profits is attained for a manufacturer 28 and machine user 12 both sides. That is, when the machine user 12 carries out decision of the risk evaluation based on the RBM method, and a maintenance plan etc. about the machines 9, such as a gas turbine. the operating ratio of a machine 9 may improve. and the charge of maintenance may also discount it, and it has the cost merit that reduction of the charge expenditure of maintenance is possible. In addition, since it strives to use a machine 9 as the assumption at the time of a design of the manufacturer for reduction of the machine user 12 of the charge expenditure of maintenance, generating of failure of a machine 9 becomes very low. In connection with it, a manufacturer 28 becomes possible [reducing the probability of occurrence / maintenance cost / of payment sharply], and can carry out a maintenance enterprise more healthfully.

[0101] In this example, the charge E of maintenance was discounting and computing the charge EC of maintenance according to the maintenance situation. However, it is also possible to hold the data shown in beforehand in the graph of the table of the charge E of maintenance corresponding to a maintenance situation or the charge E of maintenance of drawing 2 in the maintenance evaluation information database B36, and to determine the charge E of maintenance based on these tables or data, and the operating ratio forecast A and a maintenance situation.

[0102] In this example, the both sides of a manufacturer 28 and the machine user 12 have established the account to the financial agency station 13. However, even if it does not establish an account to the financial agency station 13, it is also possible to use electronic commerce. such as the usual Internet banking, and to perform remittance procedure by financial agency station 13 course.

[0103] Moreover, in this example, the costs management server 37 is performing procedure about the charge of maintenance. This is because it assumes that the section which takes the necessary procedure for the charge relation of maintenance in a manufacturer 28 is different from the section which manages the maintenance evaluation system B33. However, it is good also as the maintenance evaluation server B35 carrying out procedure about the charge of maintenance which the costs management server 37 is performing according to the situation in a manufacturer 28. That is, it considers as the maintenance evaluation server B35= costs management server 37 in this example, and the maintenance evaluation information database B36= cost-information database 38. In that case, the costs management server 37 and the cost-information database 38 can be lost. and there is a merit of the cost by saving of a server.

[0104] Moreover, a manufacturer 28 is able to perform the role of the financial agency station 13 in this example. What is necessary is just to make it the costs managerial system 34 have the function of the financial agency station 13 in that case. Drawing 9 showed it, and the costs management server 37 and the accounting server 14 are made to link directly by the communication line L32 without making the financial agency office 13 intervene. And while a manufacturer 28 keeps the machine user's 12 fund and performs investment management, the charge of maintenance is pulled out if needed. In this case, payment of the commission to a financial agency station etc. does not occur, but it is connected with both cost reductions.

[0105] Furthermore, in the condition of drawing 9, although maintenance evaluation of a machine 9 by the maintenance evaluation system B33 belongs to the manufacturer 28, as it is shown in drawing 10, it is also possible to entrust the firm 39 specializing in management which is a firm which performs maintenance evaluation of another device facility. For example, if the maintenance special firm which is a manufacturer's 28 associated company is performing maintenance evaluation, the firm will turn into the firm 21 specializing in management in drawing 10. That is, by entrusting the business in connection with the information gathering and the charge payment count of maintenance about the maintenance situation of a machine 9 to the firm 39 specializing in management, a manufacturer 28 loses need of owning the maintenance evaluation system B33, and is connected with cost reduction. In that case, it is also possible to make it to set, to make only the information gathering about the maintenance situation of a

machine 9 perform in the maintenance evaluation system B33. and make the business in connection with the charge payment count of maintenance based on the information perform to a manufacturer's 28 costs managerial system 34.

[0106] Furthermore, in this example, although the costs managerial system 34 belongs to the manufacturer 28, as shown in drawing 11, it may belong to the financial agency office 13. That is, by entrusting the business in connection with the charge payment of maintenance, a manufacturer 28 loses need of owning the costs managerial system 34 to the financial agency station 13, and is connected with it at cost reduction. In that case, by the manufacturer 28, the maintenance evaluation system B33 acquires the maintenance information about the maintenance situation of the device facility 9, and the charge of maintenance is determined by the approach in the above-mentioned example from the maintenance situation and maintenance contract. And the charge payment directions of maintenance are outputted to the costs managerial system 34 of the financial agency station 13. The costs managerial system 34 of the financial agency station 13 outputs the charge of maintenance to the accounting server 14 based on the charge payment directions of maintenance. The accounting server 14 sends the charge of maintenance to the machine user 12 (or the account) through the financial agency station 13 by technique, such as an account transfer and electronic commerce.

[0107] Moreover, in this example, the value of each multiplier (lambdam, Tr, Kg) currently used is a value beforehand set up in principle by the class of machine 3, the busy condition of magnitude and its moon, etc., and is held in the maintenance evaluation information database B36. it is alike, and it is based and, as for those values, it is usually possible the past employment situation and to also make it change. When severe employment is performed as making it change based on an employment situation, I hear that it is made to change so that the charge of maintenance may increase the value of each multiplier from the possibility of failure going up compared with the case where continuously good employment is being performed based on the count of severe employment, and it is. By making it such, it becomes the form which suited the employment situation of a machine 9 more, and the machine user 12 becomes the more powerful incentive which keeps good employment in mind, and the value of the charge of maintenance becomes possible [enlarging more the machine user's 12 charge of maintenance, and the reduction effectiveness of a manufacturer's 28 maintenance cost].

[0108] Moreover, in this example, by drawing 2. the charge E of maintenance in this invention does not depend on the value of the operating ratio forecast A. but is cheaper than the charge EC of maintenance by the conventional approach. However, depending on the value of the operating ratio forecast A. it is good also as charge E=EC of maintenance. for example, the operating ratio forecast A — case it is low — (for example. 30% or less) RBM — it is because the effectiveness of maintenance is considered that were low and the operating ratio forecast A became low even if it uses law. If that is taken into consideration, the operating ratio forecast A is the highest in 100%, and the operating ratio forecast A is the minimum in 0%, and the difference of the charge EC of maintenance of the conventional approach and the charge E of maintenance in this invention has the operating ratio forecast A possible also for the way of determining called E=EC at a low value (for example. 30%).

[0109] (An example 2) explains the configuration of the first of the gestalt of operation of the machine premium setting system which is this invention with reference to drawing 20. drawing 21. drawing 3 - drawing 4. In this example. the fundamental view of a setup of the first of the charge setting system of machine maintenance and a machine premium setting system is used. Drawing 20 is a block diagram about the gestalt of operation of the first of the machine premium setting system which is this invention, and possesses the insurance company 11 as an insurance-company office, the machine user 12 as a machine user office, the financial agency office 13, a communication line A15, a communication line B16, a communication line C17, and a communication line D17. An insurance company 11 possesses the insurance management system 2 equipped with the maintenance evaluation system 1, the premium management server 6, and the insurance information database 7 equipped with the maintenance evaluation server 4 and the maintenance evaluation information database 5. Moreover, the machine user 12 possesses the facility operations system 3 and the accounting server 14 having the maintenance server 8. a

machine 9, and the maintenance database 10.

[0110] Usually, on the occasion of the purchase of a machine 9, the machine user 12 concludes the insurance of insurance in preparation for generating of an insurance company 11 and loss. And the premium for every (every [for example.] turnaround of a machine 9) period of a certain is determined, and the machine user 12 pays a premium for every period of the to an insurance company 11. the facility operations system 3 which, on the other hand. has the machine user's 12 machine 9 — RBM of a machine 9 — the information (correspondence situations over the damage at the time of damage situations, such as each part article of a machine 9, a risk-evaluation result, and a turnaround etc.. such as repair and exchange, future maintenance plan, etc.) about the maintenance based on law is held. The maintenance evaluation system 1 of an insurance company 11 acquires the above-mentioned information on the period (every [for example.] turnaround of a machine 9) set up beforehand, and analyzes the information on the maintenance in the period. And based on the result of analysis, an insurance company 11 determines a premium the next time which is a premium in the next period, and decides to notify a machine user. Since this process is performed for every period defined beforehand. it performs measurement of a maintenance situation, and count of a premium again at the next period.

[0111] a next premium — the maintenance situation and maintenance plan of a machine 9 — RBM — it is set up so that it is carried out based on law, and it may become cheaper than the conventional premium. if good. Thereby. if the measure of maintenance of a machine 9 is performed appropriately. the machine user 12 can reduce expenses of a premium and capacity utilization rate will also improve. Since an insurance company 11 can also fall the failure incidence rate of a machine 9, expenses of insurance money can be reduced. Therefore, it becomes the premium setting approach of bringing the both sides of the device facility user 12 and an insurance company 11 profits.

[0112] Next, the configuration of each part is explained below at a detail. First, the insurance company 11 as an insurance-company station is explained. The maintenance evaluation system 1 is equipped with the maintenance evaluation server 4 and the maintenance evaluation information database 5. It is possible for there to be no need that these are not necessarily exclusively for the machine user's 12 facility operations system 3. and to deal with it also about the information on other machine users' facility operations system (not shown). The maintenance server 8 of the machine user's 12 facility operations system 3 and a communication link are possible for the maintenance evaluation server 4 through a communication line A15. And the information about the maintenance situation in the facility operations system 3 is analyzed about reception and those information to every [which was set up beforehand] period (for example. turnaround of a machine 9). The premium in the period when the degree of the facility operations system 3 was beforehand set up with it based on the result is set up. The information about the set-up premium is outputted to the insurance management system 2 as premium payment directions. Moreover, the received information and the information about the set-up premium are saved in the maintenance evaluation information database 5. In addition. the information about a maintenance situation can also be acquired by requiring of the maintenance server 8 if needed.

[0113] The maintenance evaluation information database 5 is connected to the maintenance evaluation server 4. and the information about the maintenance situation of the machine 9 which the maintenance evaluation server 4 acquired, the information about the maintenance plan sent to an insurance company based on the insurance between an insurance company 11 and the machine user 12, information required for a setup of a premium, the information about the set-up premium, etc. are held. And according to a demand of the maintenance evaluation server 4, drawing is possible for those information always.

[0114] The insurance management system 2 possesses the premium management server 6 and the insurance information database 7. There is no need that these are not necessarily exclusively for the maintenance evaluation system 1, and the combination with a process [need / other maintenance evaluation systems (not shown) and other insurance / to be managed] is also possible for it. Moreover, it is possible for there to be no need of being exclusively for the machine user's 12 facility operations system 3. and to deal with it also about the insurance management of other machine users' machine (not shown). Moreover, the

insurance management system 2 is managed by the section [handling / the section / costs, such as accounting or an accounting section with the another maintenance evaluation system 1,].

[0115] The premium management server 6 is a server linked to the maintenance evaluation server 4. And procedure about the reception of the premium from the machine user 12 is performed, and also the information (premium payment directions) about the premium which the management server 6, drawing is possible for those information always.

[0116] The insurance information database 7 is connected with the premium management server 6. And the information about the premium set up to said machine user's 12 machine 3, the information about premium procedure, and the information about a runner continuation of the premium various costs set up based on insurance are held. According to a demand of the premium management server 6, drawing is possible for those information always.

[0117] A communication line A15 is a communication line which connects an insurance company 11 and the machine user 12. They are a public line, the Internet circuit, or a dedicated line. Moreover, it is also possible to carry out by the communication link by wireless. It uses, in order that the maintenance evaluation system 1 may communicate the information about maintenance from the facility operations system 3.

[0118] Next, the machine user 12 as a machine user station is explained. The facility operations system 3 possesses the maintenance server 8, a machine 9, and the maintenance database 10. And it has managed about maintenance of a machine 9. It connects with a machine 9 and the maintenance database 10, and the maintenance server 8 performs management about maintenance of a machine 9 while connecting with the maintenance evaluation server 4 of the maintenance evaluation system 1. With it, the data about the maintenance situation of a machine 9 etc. are acquired from the exterior of a machine 9 or the facility operations system 3, and it stores in the maintenance database 10. and periodical in data concerning an employment situation according to a demand of the maintenance evaluation server 4 of an insurance company 11 — or it transmits suitably.

[0119] A machine 9 is the machine body and peripheral device which connect with the maintenance server 8 and are employed by the machine users 12, such as a gas turbine, and a boiler, a generator, and which are working in fact. In this example, it is a gas turbine.

[0120] The maintenance database 10 is connected to the maintenance server 8, and the maintenance server 8 holds the data about the employment situation of the machine 9 acquired from the exterior of a machine 9 or the facility operations system 3 inside.

[0121] The accounting server 14 is an accounting-related server which the machine user 12 has and is connected with the financial agency station 13 through the communication line C17. The premium to an insurance company 11 pays, and procedure relevant to it etc. is performed. It is managed by the section [handling / the section / costs, such as accounting or an accounting section.].

[0122] A communication line B16 is a communication line which connects the financial agency station 13 to an insurance company 11. They are a public line, the Internet circuit, or a dedicated line. Moreover, it is also possible to carry out by the communication link by wireless. It uses for the communication link for the electronic commerce of an insurance company 11 and the financial agency station 13.

[0123] A communication line C17 is a communication line which connects the financial agency station 13 to the machine user 12. They are a public line, the Internet circuit, or a dedicated line. Moreover, it is also possible to carry out by the communication link by wireless. It uses for the communication link for the electronic commerce of the machine user 12 and the financial agency station 13.

[0124] A communication line D18 is a communication line which connects an insurance company 11 and the machine user 12. They are the Internet circuit or a dedicated line. Moreover, it is also possible to carry out by the communication link by wireless. It uses for the communication link for the communication link of the insurance-related information of an insurance company 11 and

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the machine user 12, electronic commerce, etc.

[0125] the financial agency station 13 comes out of a bank, various finance business shrines, etc. which have business connections with an insurance company 11 and the machine user 12. It can have a server (not shown) and the account for dealings of an insurance company 11 and the machine user 12 can be opened. And when delivering and receiving various costs, such as electronic commerce, change processing, etc. in which the insurance company 11 and the machine user 12 used the communication line, the financial agency station 13 performs processing which mediates dealings.

[0126] Actuation of the gestalt of operation of the first of the machine premium setting system which is this invention is explained to a detail using drawing 20, drawing 21, drawing 4 – drawing 5. With reference to drawing 20 and drawing 5, drawing 5 shows the process flow of premium decision among actuation of the machine premium setting system which is this invention. First, in the phase before initiation (S101), the insurance company 11 and the machine user 12 are performing insurance about the machine premium setting system of this invention. the inside of it — RBM of the machines 9, such as relation (equivalent to drawing 21) between the operating ratio of the setting period (the premium count and the insurance horizon which are set up beforehand) of a premium, the premium count approach (the above-mentioned premium (charge of maintenance — and) count process A**-**), and Machine A, and a premium. — the contract about the maintenance planned decision which applied law is also included. Moreover, the machine user's 12 facility operations system 3 is connected with the maintenance evaluation system 1 of an insurance company 11 by the communication line A15 by the contract about information acquisition of the maintenance situation in the facility operations system 3 in insurance. And the maintenance evaluation system 1 can acquire now the data of the facility operations system 3 through a communication line A15 by the demand.

[0127] The maintenance evaluation server 4 acquires the information about a maintenance situation from the facility operations system 3 after the beginning of mission of a machine 9 (gas turbine) for every (in this example, it carries out to every turnaround of a gas turbine, and may be two years) period set up beforehand (drawing 5, S102). The information about a maintenance situation is the following information. the turnaround of a gas turbine — RBM -- risk evaluation of the machine 9 by law is performed. That is, the damage situation of all the components that constitute a gas turbine is grasped periodically, and the loss incidence rate which is a probability for the life expectancy in a components unit and breakage to arise from a crack initiation situation, a corrosion situation, etc. is evaluated. Next, the loss which is the amount of a loss by breakage of each part article is guessed, and the risk information on each components which make a risk loss incidence-rate (breakage probability) x loss (amount of a loss) is generated (what performed information illustrated by drawing 4 with each components). And based on the result of the risk evaluation of elegance. it all decides upon the maintenance plan which minimizes the above-mentioned risk within the limits of a fixed maintenance cost. By the maintenance plan, that permission is possible by routine inspection next time, or in order to check whether it shifts to conditional permission C, important point planned modification reevaluates a risk to that permission of the permission failure in drawing 4 is possible. or conditional permission C, and generates reevaluation risk information to it again. By reevaluation of a risk, when a problem is lost, a turnaround is completed. The information about the maintenance situation which the maintenance evaluation server 4 receives from the facility operations system 3 is the above-mentioned risk-evaluation information, a maintenance plan, and risk reevaluation information. The acquired information is memorized in the maintenance evaluation information database 5.

[0128] In addition, since the RBA method is performed not only at the case of routine inspection but at the time at the time of other check, the maintenance evaluation server 4 acquires the information about a maintenance situation from the facility operations system 3 if needed (the premium amendment activity shown in this example is suitably done in that case if needed).

[0129] Next, based on those data, the maintenance evaluation server 4 evaluates a maintenance situation (S103). evaluation — (I) — or each part article is all in the condition of a permission good, conditional permission good, important point planned modification, and permission improper

throat by the risk evaluation of elegance -- (II) -- as a result of processing of the maintenance service to the risk evaluation (I) of elegance, a maintenance plan, etc. all performing risk reevaluation, or the risk fell how far ******** -- it carries out by matrix ** basing the risk illustrated by drawing 4. and the information as a result of the risk reevaluation -- being based -- RBM -- the comparison with the failure incidence rate (general approach) by the usual maintenance which does not use law determines the amount of falls of the failure rate of the proper of a gas turbine. Based on the amount of falls, failure rate lambdam of the proper of a new gas turbine is computed. The amount of falls of failure rate lambdam is set up so that a risk becomes small. and it may become large. In addition. the failure rate of a gas turbine proper which becomes origin is held in the maintenance evaluation information database 5. However, it is also possible to set up using the contents of the maintenance information in connection with other RBM methods, so that insurance may be discounted.

[0130] It continues, and the maintenance evaluation server 4 performs calculation (S104) of Premium C. after [****] all performing evaluation of the risk of elegance, calculation of failure rate lambdam of the proper of a gas turbine, etc. That is. the maintenance evaluation server 4 first acquires the use elapsed-years correction factor Ky currently held in the maintenance evaluation information database 5, the release time Tr at the time of failure, and the detection time amount Td (forecast) of failure. obtained lambdam which was K(ied) and computed -- being based -- several !:lambda=Ky-lambdam of the above-mentioned premium (charge of maintenance -- and) count process ** The failure rate lambda of a gas turbine is computed. next, the repair time amount T which must stop a gas turbine for repair etc. when failure occurs -- several 2 of the above-mentioned premium (charge of maintenance -- and) count process ** -- .:T=Td+Tr It computes. However, time amount, Tr which detection takes from Td:failure generating. It is the time amount which restoration of failure takes.

[0131] next, the operating ratio forecast A which is a forecast of the operating ratio to the next turnaround of a gas turbine -- several [of the above-mentioned premium (charge of maintenance -- and) count process **] -- it computes by 4:A=mu/(lambda+mu). however, the recoverability mu -- several -- 3:mu=1/T it is . the premium C of the next period is computed by the process of above-mentioned premium (charge of maintenance -- and) count process **, and ** based on the value of the calculated operating ratio forecast A.

[0132] Based on the insurance of the machine user 12 and an insurance company 11, Premium C is determined as mentioned above by the information interchange about the maintenance situation between a gas turbine and the maintenance evaluation system 1. The information is held at the maintenance evaluation information database 5. And based on the premium C, the maintenance evaluation server 4 outputs premium payment directions to the premium management server 6 of the insurance management system 2 (S105). and processing of premium decision ends him (S106).

[0133] The premium management server 6 sends the notice of a premium payment request of degree batch by the method of payment set up based on the contract of an insurance company 11 and the machine user 12 through a communication line D18 to the machine user's 12 accounting server 14. The accounting server 14 answers the notice and pays the premium of degree batch to an insurance company 11. As a method of payment, it pays about a payment period according to contracts, such as payment for every year, and payment for every turnaround. Moreover, an insurance company 11, the machine user 12, and three persons of the financial agency station 13 exchange contracts of electronic commerce of having used the communication line in advance, and are made to run in the electronic procedure in the financial agency station 13 about sending of a premium easily based on it. For example, an insurance company 11 and the machine user 12 establish an account to both the financial agency stations 13. And using a communication line C17. the machine user's 12 accounting server 14 takes out payment directions to the financial agency station 13, and transfers a premium to the account of an insurance company 11. The financial agency station 13 notifies the financial agency station of an insurance company 11 of payment information through the premium management server 6 of an insurance company 11 of payment information through a communication line B16.

[0134] Performing the above actuation every two years which are spacing of the turnaround of

the gas turbine beforehand set up by insurance. the machine user 12 pays a premium to an insurance company. It continues within the term of insurance based on insurance. and payment of this premium is performed. However, changing about a period by a contract etc. is possible.

[0135] By actuation of the above this invention, a setup of a premium with profits is attained for an insurance company 11 and machine user 12 both sides. That is, when the machine user 12 carries out decision of the risk evaluation based on the RBM method, and a maintenance plan etc. about the machines 9, such as a gas turbine. the operating ratio of a machine 9 may improve. and a premium may also discount it, and it has the cost merit that reduction of premium expenditure is possible. In addition, since it strives to use a machine 9 as the assumption at the time of a design of the manufacturer for reduction of premium expenditure of the machine user 12, generating of failure of a machine 9 becomes very low. In connection with it, an insurance company 11 becomes possible [reducing the probability of occurrence / insurance money / of payment sharply]. and can carry out an insurance enterprise more healthfully.

[0136] In this example. Premium C was discounting and computing Premium CC according to the maintenance situation. However, it is also possible to hold the data shown in beforehand in the graph of the table of the premium C corresponding to a maintenance situation or the premium C of drawing 21 in the maintenance evaluation information database 5, and to determine Premium C based on these tables or data, and the operating ratio forecast A and a maintenance situation.

[0137] In this example. the both sides of an insurance company 11 and the machine user 12 have established the account to the financial agency station 13. However, even if it does not establish an account to the financial agency station 13, it is also possible to use electronic commerce, such as the usual Internet banking, and to perform remittance procedure by financial agency station 13 course.

[0138] Moreover, in this example, the premium management server 6 is performing procedure about a premium. This is because it assumes that the section which takes the necessary procedure for the premium relation in an insurance company 11 is different from the section which manages the maintenance evaluation system 1. However, it is good also as the maintenance evaluation server 4 carrying out procedure about the premium which the premium management server 6 is performing according to the situation in an insurance company 11. That is, it considers as the maintenance evaluation server 4= premium management server 6 in this example. and the maintenance evaluation information database 5= insurance information database 7. In that case. the premium management server 6 and the insurance information database 7 can be lost, and there is a merit of the cost by saving of a server.

[0139] Moreover, an insurance company 11 is able to perform the role of the financial agency station 13 in this example. What is necessary is just to make it the insurance management system 2 have the function of the financial agency station 13 in that case. Drawing 22 showed it, and the premium management server 6 and the accounting server 14 are made to link directly by the communication line E19 without making the financial agency office 13 intervene. And while an insurance company 11 keeps the machine user's 12 fund and performs investment management, a premium is pulled out if needed. In this case, payment of the commission to a financial agency station etc. does not occur. but it is connected with both cost reductions.

[0140] Furthermore, in the condition of drawing 22, although maintenance evaluation of the machine 9 by the maintenance evaluation system 1 belongs to the insurance company 11, as it is shown in drawing 23, it is also possible to entrust the firm 21 specializing in management which is a firm which performs maintenance evaluation of another device facility. For example, if the manufacturer (not shown) of a machine 9 is performing maintenance evaluation, the section which performs maintenance evaluation of a manufacturer will serve as the firm 21 specializing in management in drawing 23 by the contract between 3 persons of a manufacturer, an insurance company 11, and the machine user 12 etc. That is, by entrusting the business in connection with the information gathering and premium payment count about a maintenance situation of a machine 9 to a manufacturer, an insurance company 11 loses its need of owning the maintenance evaluation system 1, and is connected with cost reduction. In that case, it is also possible to make it to set. to make only the information gathering about the maintenance

situation of a machine 9 perform in the maintenance evaluation system 1, and make the business in connection with the premium payment count based on the information perform to the insurance management system 2 of an insurance company 11.
[0141] Furthermore, in this example, although the insurance management system 2 belongs to the insurance company 11, as shown in drawing 24, it may belong to the financial agency office 13. That is, by entrusting the business in connection with premium payment, an insurance company 11 loses its need of owning the insurance management system 2 to the financial agency station 13, and is connected with it at cost reduction. In that case, in an insurance company 11, the maintenance evaluation system 1 acquires the maintenance information about the maintenance situation of the device facility 9, and a premium is determined by the approach in the above-mentioned example from the maintenance situation and insurance. And premium payment directions are outputted to the insurance management system 2 of the financial agency station 13. The insurance management system 2 of the financial agency station 13 transmits a premium to the accounting server 14 based on premium payment directions. The accounting server 14 sends a premium to the machine user 12 (or the account) through the financial agency station 13 by technique, such as an account transfer and electronic commerce.
[0142] Moreover, in this example, the value of each multiplier (lambdam, Tr, Kg) currently used is a value beforehand set up in principle by the class of machine 3, the busy condition of magnitude and its moon, etc., and is held in the maintenance evaluation information database 5. it is alike, and it is based and, as for those values, it is usually possible the past employment situation and to also make it change. When severe employment is performed as making it change based on an employment situation, I hear that it is made to change so that a premium may increase the value of each multiplier from the possibility of failure going up compared with the case where continuously good employment is being performed based on the count of severe employment, and it is. By making it such, it becomes the form which suited the employment situation of a machine 9 more, and the machine user 12 becomes the more powerful incentive which keeps good employment in mind, and the value of a premium becomes possible [enlarging more the machine user's 12 premium, and the reduction effectiveness of the insurance money of an insurance company 11].
[0143] Moreover, in this example, by drawing 21, the premium C in this invention does not depend on the value of the operating ratio forecast A, but is cheaper than the premium CC by the conventional approach. However, depending on the value of the operating ratio forecast A, it is good also as premium C=CC. for example, the operating ratio forecast A -- case it is low -- (for example, 30% or less) RBM -- it is because the effectiveness of maintenance is considered that were low and the operating ratio forecast A became low even if it uses law. If that is taken into consideration, the operating ratio forecast A is the highest in 100%, and the operating ratio forecast A is the minimum in 0%, and the difference of the premium CC of the conventional approach and the premium C in this invention has the operating ratio forecast A possible also for the way of determining called C=CC at a low value (for example, 30%).
[0144] (Example 3) The gestalt of operation of the second of the charge setting system of machine maintenance which is this invention is explained with reference to an accompanying drawing. In this example, the fundamental view of a setup of the second of the charge setting system of machine maintenance and the charge setting system of machine maintenance is used.
[0145] First, the configuration of the second of the gestalt of operation of the charge setting system of machine maintenance which is this invention is explained. Drawing 12 is a block diagram about the gestalt of operation of the second of the charge setting system of machine maintenance which is this invention, and possesses the manufacturer 28 as a manufacturer office, the machine user 12 as a machine user office, the financial agency office 13, a communication line I29, a communication line J30, a communication line K31, and a communication line L32.
[0146] The manufacturer 28 as a manufacturer station possesses the remote monitoring system 25 equipped with the remote monitor server 22 and the device information database 23, the maintenance evaluation system B33 as a maintenance evaluation system equipped with the maintenance evaluation server B35 as a maintenance evaluation server, and the maintenance

evaluation information database B36 as a maintenance evaluation information database, the costs managerial system 34 equipped with the costs management server 37 and the cost-information database 38, and the communication link interface B42. While dealing with the information in connection with a machine, acquisition of the information about the employment situation of a machine and the information relevant to maintenance, analysis, etc. are performed. Moreover, the machine user 12 as a machine user station possesses the facility operations system 3 equipped with the maintenance server 8, a machine 9, and the maintenance database 10, and the accounting server 14. While concluding a manufacturer 28 and a maintenance contract on the occasion of use of a machine 9, the employment information on a machine 9 and the information about the maintenance are suitably transmitted to a manufacturer 28.
[0147] Usually, on the occasion of the purchase of a machine 9, the machine user 12 concludes the maintenance contract about maintenance of a manufacturer 28 and a machine 9. And the charge of maintenance for every period of a certain is determined, and the machine user 12 pays the charge of maintenance for every period of the to a manufacturer 28.
[0148] The machine user's 12 machine 9 holds the information about employment situations, such as an output, a count of start and stop, and output rate of change. A manufacturer's 28 remote monitoring system 25 analyzes the employment situation of the machine 9 in the period based on the information about the above-mentioned employment situation of the period set up beforehand. And based on the result of analysis, a manufacturer 28 determines the correction factor in connection with amendment of the charge of maintenance, and outputs to a maintenance evaluation system with a part of employment information.
[0149] On the other hand, the machine user's 12 maintenance database 10 holds the information about the maintenance based on the risk base maintenance method of a machine 9. A manufacturer's 28 maintenance evaluation system B33 analyzes the information about the aforementioned maintenance, and determines the next charge of maintenance about a machine 9 based on the analysis result, the above-mentioned correction factor, and a part of employment information. And it outputs to the costs management server 37 as maintenance payment directions next time.
[0150] The costs management server 37 decides to notify the machine user 12 of the information. Since this process is performed for every period set up beforehand, it performs measurement of an employment situation, and count again at the next period.
[0151] The next charge of maintenance will introduce the approach of setting up so that it may be reduced as compared with the case where that is not right, if the employment situation of a machine 9 is the good employment which observed rated value and a design upper limit. Thereby, if the machine user 12 employs a machine proper and does not perform severe employment, he can reduce expenses of the charge of maintenance and capacity utilization rate also improves. Since a manufacturer 28 can also fall the failure incidence rate of a machine, expenses of a maintenance cost can be reduced.
[0152] Furthermore, the view of the RBM method which is an example 1 and was explained is also doubled and introduced. as the machine user 12 side -- RBM -- reducing the risk of loss by the machine efficiently by performing maintenance by law, and reducing loss leads not only to improvement in the operating ratio of a machine but to reduction of the charge of maintenance. Moreover, as a manufacturer 28, the risk of generating of the maintenance-cost payment by the failure of a machine set as the object of maintenance can be reduced.
[0153] By installation of the fundamental view of a setup of the second of the charge setting system of machine maintenance which combined two approaches above, and the charge setting system of machine maintenance, the charge setting approach of maintenance of bringing profits further to the both sides of the device facility user 12 and a manufacturer 28 becomes possible.
[0154] Next, the configuration of each part is explained with reference to drawing 12 below at a detail. First, the manufacturer 28 as a manufacturer station is explained. The remote monitoring system 25 is equipped with the remote monitor server 22 and the device information database 23. It is possible for there to be no need that these are not necessarily exclusively for the machine user's 12 facility operations system 3, and to deal with it also about the information on other machine users' facility operations system (not shown).

[0155] The machine 9 of the machine user's 12 facility operations system 3 and a communication link are possible for the remote monitor server 22 through the communication link interface B42 and a communication line 129. And the information about the employment situation of a machine 9 is analyzed about reception and its employment situation to every [which acquires the employment information set up beforehand] period (for example, henceforth an " employment information acquisition period" for one month). With it, the correction factor in the next employment information acquisition period of a machine 9 is determined based on the result. A part of information about the determined correction factor and employment information are outputted to the maintenance evaluation system B33. Moreover, the received information and the information about the determined correction factor are saved in the device information database 23. In addition, the information about an employment situation can also be acquired by requiring of a machine 9 if needed.

[0156] The device information database 23 is connected to the remote monitor server 22, and according to a demand of the remote monitor server 22, drawing is possible for those information always.

[0157] The maintenance evaluation system B33 as a maintenance evaluation system is equipped with the maintenance evaluation server B35 and the maintenance evaluation information database B36. It is possible for there to be no need that these are not necessarily exclusively for the machine user's 12 facility operations system 3, and to deal with it also about the information on other machine users' facility operations system (not shown).

[0158] The maintenance server 8 of the machine user's 12 facility operations system 3 and a communication link are possible for the maintenance evaluation server B35 through the communication link interface B42 and a communication line 129. And the information about the maintenance situation in the facility operations system 3 is analyzed about reception and its maintenance situation to every [which acquires the maintenance information set up beforehand] period (for example, it is called a " maintenance information acquisition period" for two years and the following at intervals of the turnaround of a machine 9). On the other hand, information, such as a correction factor computed from the employment situation of a machine 9, is outputted from the remote monitor server 22. The charge of maintenance of the machine 9 in the appropriate period of the facility operations system 3 is set up from information, such as the correction factor, and the analysis result of the above-mentioned maintenance situation. The information about the set-up charge of maintenance is outputted to the costs managerial system 34 as charge payment directions of maintenance. Moreover, the received information and the information about the set-up charge of maintenance are saved in the maintenance evaluation information database B36. In addition, the information about a maintenance situation can also be acquired by requiring of the maintenance server 8 if needed.

[0159] The maintenance evaluation system B36 as a maintenance evaluation system is connected to the maintenance evaluation server B35, and the information about discount of the information about the maintenance situation of the machine 9 which the maintenance evaluation server B35 acquired, the information about the maintenance plan sent to a manufacturer based on the maintenance contract between a manufacturer 28 and the machine user 12, information required for a setup of the charge of maintenance, the set-up charge of maintenance, or the charge of maintenance etc. holds. And according to a demand of the maintenance evaluation server B35, drawing is possible for those information always.

[0160] The costs managerial system 34 possesses the costs management server 37 and the cost-information database 38. There is no need that these are not necessarily exclusively for the remote monitoring system 25 or the maintenance evaluation systems (not shown) and remote monitoring combination with other maintenance evaluation systems (not shown) and remote monitoring system (not shown), a process [need / other maintenance / to be managed], etc. is also possible for it. Moreover, it is possible for there to be no need of being exclusively for the

machine user's 12 facility operations system 3, and to deal with it also about the maintenance control of other machine users' machine (not shown). Moreover, the costs managerial system 34 is managed by the section [handling / the section / costs, such as accounting or an accounting section different from the remote monitoring system 25 or the maintenance evaluation system B33].

[0161] The costs management server 37 is a server linked to the maintenance evaluation server B35. And procedure about the reception of the charge of maintenance from the machine user 12 is performed, and also the information (charge payment directions of maintenance) about the charge of maintenance which the maintenance evaluation server B35 set up is answered, and procedure about the charge of maintenance is performed based on the contents of a contract held at the information and the cost-information database 38.

[0162] The cost-information database 38 is connected with the costs management server 37. And the information about the charge of maintenance set up to said machine user's 12 machine 9, the information about the charge procedure of maintenance, and the information about a runner continuation of the various costs set up based on the maintenance contract are held. According to a demand of the costs management server 37, drawing is possible for those information always.

[0163] A communication line I29 is a communication line which connects a manufacturer 28 and the machine user 12. They are a public line, the Internet circuit, or a dedicated line. Moreover, it is also possible to carry out by the communication link by wireless. It uses, in order that the remote monitoring system 25 and the maintenance evaluation system B33 may communicate the information about employment, and the information about maintenance from the facility operations system 3.

[0164] The communication link interface B42 is an interface for a communication link which they use in case the remote monitoring system 25 and the maintenance evaluation system B33 communicate with the facility operations system 3 through a communication line I29.

[0165] Next, the machine user 12 as a machine user station is explained. The facility operations system 3 possesses the maintenance server 8, a machine 9, and the maintenance database 10. And it manages about maintenance of a machine 9, and also the information on the operation situation in the machine set as the object of maintenance is held. And a remote monitor is carried out by the appropriate facility relevant to the machine user 12, and the operation situation can cope with it quickly to generating of accident or abnormalities, or its omen.

[0166] It connects with a machine 9 and the maintenance database 10, and the maintenance server 8 performs management about maintenance of a machine 9 while connecting with the maintenance evaluation server B35 of the maintenance evaluation system B33. With it, the information about the maintenance situation of a machine 9 is acquired from the exterior of a machine 9 or the facility operations system 3, and it stores in the maintenance database 10. and periodical in the information concerning a maintenance situation according to a demand of a manufacturer's 28 maintenance evaluation server B35 — or it transmits suitably. Moreover, the support is performed in case a machine 9 transmits the information about an employment situation according to a demand of a manufacturer 28.

[0167] A machine 9 is the machine body and peripheral device which connect with the maintenance server 8 and are employed by the machine users 12, such as a gas turbine, and a boiler, a generator, and which are working in fact. In this example, it is a gas turbine. And the information about the employment situation of machine 9 self is held inside, and the information is transmitted to it through the maintenance server 8 according to a demand of a manufacturer 28.

[0168] Since the accounting server 14, the communication line J30, the communication line K31, the communication line L32, and the financial agency station 13 are the same as that of an example 1, explanation is omitted.

[0169] Actuation of the gestalt of operation of the second of the charge setting system of machine maintenance which is this invention is explained to a detail using drawing 5, drawing 13 - drawing 16, drawing 17, drawing 12, and drawing 19. this example — setting — first — the phase of the first maintenance contract — it is — a manufacturer — RBM of the machine user's

12 machine 9 (gas turbine) -- a contract of amendment of the charge of maintenance by the maintenance situation and employment situation based on law is made. In addition, the charge EC of maintenance by the conventional approach is used for the charge of maintenance in the time of the beginning as a charge of criteria maintenance used as criteria. Next, if operation of a gas turbine (machine 9) is started, a manufacturer 28 will acquire the information on the employment situation of a gas turbine for every employment information acquisition period by the maintenance contract, and will analyze. Moreover, the information on a maintenance situation is acquired and analyzed for every maintenance information acquisition period. And based on those results, it asks for the charge EE of maintenance according to the above-mentioned charge (and premium) count process B of maintenance. It ****, and an employment information acquisition period may be longer than a maintenance information acquisition period, or may be short, may be the same, and is determined by the maintenance contract.

[0170] By this this invention, the machine user 12 is making an employment situation good, without carrying out severe operation, and performing maintenance plan and its implementation appropriately and efficiently, and since the charge of maintenance may give a discount sharply, he becomes possible [tying to reduction of the charge of maintenance and the improvement in an operating ratio of a gas turbine, and reinforcement]. Moreover, for a manufacturer 28, since the failure rate of a gas turbine falls sharply, it becomes possible to reduce expenditure of a maintenance cost sharply.

[0171] With reference to drawing 12, drawing 5, and drawing 17, the process flow of the charge decision of maintenance is explained among actuation of the charge setting system of machine maintenance of this invention. Here, a maintenance information acquisition period and it may be two years in this example. Moreover, an employment information acquisition period is set to T2.

[0172] First, in the phase before initiation (S201) of drawing 17, the manufacturer 28 and the machine user 12 are performing the maintenance contract about the charge setting system of machine maintenance of this invention. In it, the setting period of the charge of maintenance (the charge count approach of maintenance (above-mentioned charge (and premium) count process of maintenance B(1) - (9) etc.), the relation (equivalent to drawing 19) between the operating ratio forecast A of a gas turbine, and the charge of maintenance, and RBM of a gas turbine -- the contract of acquisition of the maintenance information by the maintenance planned decision and the manufacturer 28 who applied law, acquisition of the employment information on the gas turbine by the manufacturer 28, etc. is also included. Moreover, the machine user's 12 facility operations system 3, and a manufacturer's 28 maintenance evaluation system B33 and remote monitoring system 25 are connected by the communication line I29 by the contract about acquisition of the maintenance information in a maintenance contract, and employment information. And the maintenance evaluation system B33 and the remote monitoring system 25 can acquire the above-mentioned information now from the facility operations system 3 through a communication line I29 by the demand. The charge EC of maintenance by the conventional approach is used for the charge of maintenance in this phase (at the time of the beginning) as a charge of criteria maintenance used as criteria.

[0173] With reference to drawing 17, the remote monitor server 22 acquires the data about an employment situation from a gas turbine after the beginning of mission of a gas turbine to every employment information acquisition period T1 (this example one month) (drawing 17, S202). The data about an employment situation are the output at the time of the employment in a gas turbine, a count of start and stop, and the output rate of change per unit time amount. In the case of this example, the information for 1 month is acquired. The acquired information is memorized in the device information database 23.

[0174] Next, based on those data, the remote monitor server 22 determines the above-mentioned correction factor (Kp, Ks, Kr) (S203). In decision, it carries out in the process of (1) of the above-mentioned charge (and premium) count process B of maintenance, (2), and (3), respectively. In addition, the data about drawing 13 - drawing 15 are held in the device information database 23.

[0175] The remote monitor server 22 acquires failure rate lambdamc of the gas turbine proper currently held in the device information database 23. the use elapsed-years correction factor Ky, and the release time Tr at the time of failure while computing and determining a correction factor (Kp, Ks, Kr) as mentioned above (S203). Those information is outputted to the maintenance evaluation server B35. In addition, the computed information is memorized in the device information database 23.

[0176] The maintenance evaluation server B35 changes failure rate lambdamc of a gas turbine proper into lambdam based on the information about a maintenance situation (lambda m=lambda mc when [However] there is no information about maintenance). Kp, Ks, Kr, and lambda which were obtained -- m and Ky -- being based -- several 6:lambda=a~Ky~Kp~Ks~lambdam of above-mentioned charge (and premium) count process of maintenance B (4) The failure rate lambda of a gas turbine is computed (S204).

[0177] The repair time amount T which must stop a gas turbine on the other hand for repair etc. when failure occurs is number 7:T=Td+Tr of above-mentioned charge (and premium) count process of maintenance B (5). It is computed (S205). However, time amount, Tr which detection takes from Td failure generating: It is the time amount which restoration of failure takes. Here, by the remote monitor of the gas turbine by the device facility user 12, since it is a short time very much. Td can be disregarded to Tr.

[0178] next, the operating ratio forecast A which is a forecast of the operating ratio of next month of a gas turbine -- several 9:A=mu/(lambda+mu) of above-mentioned charge (and premium) count process of maintenance B (6) It computes (S206). however, the recoverability mu -- several -- 8:mu=1/T it is.

[0179] The maintenance evaluation server B35 determines the charge E of maintenance based on an employment situation as the last. It is based on the operating ratio forecast A computed as mentioned above, and is the amount of a loss D Number 10:D=Kg (1-A) of above-mentioned charge (and premium) count process of maintenance B (7) It computes. The charge E of maintenance is computed from this value (refer to charge (and premium) count process of maintenance B (8)). In addition, the data about drawing 19 are held in the maintenance evaluation information database B36.

[0180] here, from a start up, till after the first maintenance information acquisition period T2 (this example for two years) progress, in order that there may be no information on a maintenance situation, the charge E of maintenance only based on the information on an operation situation is used as a charge of maintenance of a forward type (this time lambdam=lambdamc: -- with no amendment). That is, the maintenance evaluation server B35 determines said charge E of maintenance as a next (next month) charge of maintenance (S207). And the process for the charge count of maintenance is completed (S208). The determined next charge of maintenance is outputted to the costs management server 37 as charge payment directions of maintenance.

[0181] On the other hand, since the information about a maintenance situation also becomes acquirable, after the first maintenance information acquisition period T2 progress computes the charge EE of maintenance. That is, based on failure rate lambdam (finishing [amendment]) of the correction factor (Kp, Ks, Kr) outputted by the remote monitor server 22 and a gas turbine proper, the use elapsed-years correction factor Ky, and the release time Tr at the time of failure, the charge EE of maintenance in which maintenance information was made to reflect is computed (refer to charge (and premium) count process of maintenance B (9)). And the maintenance evaluation server B35 determines said charge EE of maintenance as a next charge of maintenance (S207). And the process for the charge count of maintenance is completed (S208). The determined next charge of maintenance is outputted to the costs management server 37 as charge payment directions of maintenance.

[0182] Amendment of the charge of maintenance of a part based on the information on a maintenance situation is performed every maintenance information acquisition period T2 fundamentally. Namely, amendment of outage lambdam for calculating the charge EE of maintenance is performed for every T2. In order to use the same lambdam in the meantime, the charge EE of maintenance is changed using the information on an employment situation

(correction factors Kp, Ks, and Kr).

[0183] The costs management server 37 sends the notice of the charge payment request of maintenance for next month by the method of payment set up based on the contract of a manufacturer 28 and the machine user 12 through a communication line L32 to the machine user's 12 accounting server 14. Since it is the same as that of an example 1, the process and related matters in connection with this payment are omitted.

[0184] Carrying out the above actuation to every [which was beforehand set up by the maintenance contract] period (the employment information acquisition period T1 and maintenance information acquisition period T2), the machine user 12 pays the charge of maintenance to a manufacturer. It continues in the maintenance time based on a maintenance contract, and payment of this charge of maintenance is performed. However, changing about a period by a contract etc. is possible.

[0185] By actuation of the above this invention, a setup of the charge of maintenance with maintenance for a manufacturer 28 and machine user 12 both sides, namely, the profits is attained for a manufacturer 28 and machine user 12 severe about a machine 9 (gas turbine) — not carrying employment with the machine user 12 severe about a machine 9 (gas turbine) — not carrying out — and RBM — there is a cost merit called the reduction of the costs in connection with [if decision and its operation profit of a suitable maintenance plan are performed, an operating ratio may improve by failure of a machine 9 decreasing, and the charge of maintenance may also decrease, and] employment of a machine 9, or the charge expenditure of maintenance based on the law. In addition, in connection with generating of failure of a machine 9 becoming very low, a manufacturer 28 becomes possible [reducing the probability of occurrence / maintenance cost / of payment sharply], and can carry out a maintenance enterprise more healthfully.

[0186] In this example, all (Kp, Ks, Kr) of the output at the time of employment, the count of start and stop, and three kinds of correction factors in connection with the output rate of change per unit time amount are used. However, if at least one kind of value of three kinds of those values, it can carry out like this example. For example, when it has become clear that very strong effect is leaked to a failure rate lambda depending on [case / where the count of start and stop is others] the class of machine 9, it is also possible to calculate and use a failure rate lambda as not using Kp and Kr (or Kp=Kr=1). The same is said of an output and output rate of change.

[0187] Moreover, in this example, although an output, the count of start and stop, and output rate of change are referred to in order to measure the employment situation of a machine 9, this is because the gas turbine is made into the example. It is possible by using other suitable parameters according to the class of machine 9 to grasp the failure rate of a machine 9 to accuracy more. For example, if it is chemical reaction equipment, they are an operating temperature, the rate of change and an operating pressure, the rate of change, the count of a shutdown, etc. It is an important point to choose what has influence on generating of failure greatly in the various parameters which show the employment situation of the machine.

[0188] Moreover, in this example, the costs management server 37 is performing procedure about the charge of maintenance. This is because it assumes that the section which takes the necessary procedure for the charge relation of maintenance in a manufacturer 28 is different from the section which manages the remote monitoring system 25 and the maintenance evaluation system B33. However, they are able to carry out this invention according to the situation in a manufacturer 28, even if three servers, the remote monitor server 22, the maintenance evaluation server B35, and the costs management server 37, are unified by two or one. In connection with it, the device information database 23, the maintenance evaluation information database B36, and the cost-information database 38 should just also unify appropriately if needed according to a server's situation. In that case, there is a merit of the cost by saving of a server.

[0189] Moreover, a manufacturer 28 is able to perform the role of the financial agency station 13 in this example. What is necessary is just to make it the costs managerial system 34 have the function of the financial agency station 13 in that case. The costs management server 37 and the accounting server 14 are made to link directly by the communication line without making the financial agency station 13 intervene. And while a manufacturer 28 keeps the machine user's 12

fund and performs investment management, the charge of maintenance is pulled out if needed. In this case, payment of the commission to a financial agency station etc. does not occur, but it is connected with both cost reductions.

[0190] Furthermore, in the condition of drawing 12, although acquisition of the information about the employment situation of the machine 9 by the remote monitoring system 25 belongs to the manufacturer 28, as it is shown in drawing 18, it is also possible to entrust the firm 21 specializing in management which is a firm which performs the remote monitor of another device facility. For example, if the related company which performs maintenance related business of a machine 9 specially is performing the remote monitor, the related company concerned will become the firm 21 specializing in management in drawing 26 by the contract between 3 persons of a related company, a manufacturer 28, and the machine user 12 etc. That is, by entrusting the business in connection with a part of the information gathering and the charge payment count of maintenance about the employment situation of a machine 9 to the firm 21 specializing in management, a manufacturer 28 loses need of owning the remote monitoring system 25, and is connected with cost reduction. In that case, it is also possible to make it to set, to make only the information gathering about the employment situation of a machine 9 perform in the remote monitoring system 25, and make the business in connection with the charge payment count of maintenance based on the information perform to a manufacturer's 28 maintenance evaluation system B33.

[0191] Furthermore, in this example, although the costs managerial system 34 belongs to the manufacturer 28, it may belong to the financial agency office 13. That is, by entrusting the business in connection with the charge payment of maintenance, a manufacturer 28 loses need of owning the costs managerial system 34 to the financial agency station 13, and is connected with it at cost reduction.

[0192] In that case, by the manufacturer 28, the remote monitoring system 25 acquires the employment information about the employment situation of the device facility 3, the maintenance evaluation system B33 acquires the information about a maintenance situation, and the charge of maintenance is determined by the approach in the above-mentioned example from the employment situation, maintenance situation, and maintenance contract. And the charge payment directions of maintenance are outputted to the maintenance control system of the financial agency station 13. Based on the charge payment directions of maintenance, the costs managerial system 34 of the financial agency station 13 acquires ****** expense from the machine user 12 (or the account) by technique, such as an account transfer and electronic commerce, and remits to a manufacturer 28 (or the account).

[0193] Moreover, in this example, the value of each multiplier (Kp, Ks, Kr, lambdam, Tr, Kg) currently used is a value beforehand set up in principle by the class of machine 9, the busy condition of magnitude and its moon, etc., and is held in the device information database 5. As for those values, it is possible to also make it change based on a past employment situation and a past maintenance situation. By making it such, it becomes the form which suited the employment situation of a machine 9 more, and the machine user 12 becomes the more powerful incentive which keeps good employment in mind, and the value of the charge of maintenance becomes possible [enlarging more the machine user's 12 charge of maintenance, and the reduction effectiveness of a manufacturer's 28 maintenance cost].

[0194] In this invention, the information about a maintenance situation is reflected in failure rate lambdam in the charge count processes A and B of maintenance. However, after calculating the charge of maintenance, it is also possible to take the approach of giving a discount, based on the information about a maintenance situation. That is, suppose that the discount rate of the charge of maintenance is used as information about modification of the charge of maintenance. For example, when a maintenance situation is good, according to the degree, the charge of maintenance is referred to as giving a discount 30% 20% 10%. Thereby, profits are got by both the above manufacturers and machine users.

[0195] Moreover, in explanation of each example of this invention, when an employment situation and a maintenance situation are good, it is supposed that the charge of maintenance will fall (drawing 2 and drawing 19). However, when an employment situation and a maintenance situation

are not in a desirable condition. naturally possibility that it must stop having to pay a high amount of money as compared with the usual charge of maintenance is one of the contents of the charge setting system of machine maintenance a certain thing of whose is also this invention. When an employment situation and a maintenance situation are not in a desirable condition, a machine user may think that a kind of penalty is imposed. That is, if an employment situation is bad, since the correction factor (Kp, Ks, Kr) in the charge count of maintenance will exceed 1.0, the amount of a loss mounts up and the charge of maintenance also increases. Moreover, if a maintenance situation is bad, since failure rate lambdam in the charge count of maintenance will increase, the amount of a loss mounts up and the charge of maintenance also increases.

[0196] (Example 4) The gestalt of operation of the second of the machine premium setting system which is this invention is explained with reference to an accompanying drawing. In this example, the fundamental view of a setup of the second of the charge setting system of machine maintenance and a machine premium setting system is used.

[0197] First, the configuration of the second of the gestalt of operation of the machine premium setting system which is this invention is explained. Drawing 25 is a block diagram about the gestalt of operation of the second of this invention, and possesses the insurance company 11 as an insurance-company office, the machine user 12 as a machine user office, the financial agency office 13. a communication line A15. a communication line B16. a communication line C17, and a communication line D18.

[0198] The insurance company 11 as an insurance-company station possesses the remote monitoring system 25 equipped with the remote monitor server 22 and the device information database 23. the maintenance evaluation system 1 equipped with the maintenance evaluation server 4 and the maintenance evaluation information database 5, the insurance management system 2 equipped with the premium management server 6 and the insurance information database 7. and the communication link interface A24. While dealing with the insurance in connection with a machine, acquisition of the information about the employment situation of a machine and the information relevant to maintenance, analysis, etc. are performed. Moreover, the machine user 12 as a machine user station possesses the facility operations system 3 equipped with the maintenance server 8. a machine 9, and the maintenance database 10, and the accounting server 14. While concluding an insurance company 11 and insurance on the occasion of use of a machine 9, the employment information on a machine 9 and the information about the maintenance are suitably transmitted to an insurance company 11.

[0199] Usually, on the occasion of the purchase of a machine 9, the machine user 12 concludes the insurance of the insurance about damage of an insurance company 11 and a machine 9. And the premium for every period of a certain is determined, and the machine user 12 pays a premium for every period of the to an insurance company 11.

[0200] The machine user's 12 machine 9 holds the information about employment situations, such as an output, a count of start and stop, and output rate of change. The remote monitoring system 25 of an insurance company 11 analyzes the employment situation of the machine 9 in the period based on the information about the above-mentioned employment situation of the machine 9. And based on the result of analysis, an insurance company 11 determines the correction factor in connection with amendment of a premium, and outputs to a maintenance evaluation system with a part of employment information.

[0201] On the other hand, the machine user's 12 maintenance database 10 holds the information about the maintenance based on the risk base maintenance method of a machine 9. The maintenance evaluation system 1 of an insurance company 11 analyzes the information about the the aforementioned maintenance, and determines the next premium about a machine 9 based on the analysis result, the above-mentioned correction factor, and a part of employment information. And it outputs to the premium management server 6 as insurance payment information.

[0202] The premium management server 6 decides to notify the machine user 12 of the directions next time. Since this process is performed for every period set up beforehand, it performs measurement of an employment situation, and count again at the next period.

[0203] A next premium will introduce the approach of setting up so that it may be reduced as compared with the case where that is not right, if the employment situation of a machine is the good employment which observed rated value and a design upper limit. Thereby, if the machine user 12 employs a machine proper and does not perform severe employment, he can reduce expenses of a premium and capacity utilization rate also improves. Since an insurance company 11 can also fall the failure incidence rate of a machine, expenses of insurance money can be reduced. Furthermore, the view of the RBM method which is an example 2 and was explained is also doubled and introduced. as the machine user 12 side -- RBM -- reducing the risk of loss by the machine efficiently by performing maintenance by law, and reducing loss leads not only to improvement in the operating ratio of a machine but to reduction of a premium. Moreover, as an insurance company 11, the risk of generating of the insurance money payment by the failure of a machine set as the object of insurance can be reduced. By installation of the fundamental view of a setup of the second of the charge setting system of machine maintenance which combined two approaches above, and the charge setting system of machine maintenance, the premium setting approach of bringing profits further to the both sides of the device facility user 12 and an insurance company 11 becomes possible.

[0204] Next, the configuration of each part is explained with reference to drawing 25 below at a detail. First, the insurance company 11 as an insurance-company station is explained. The remote monitoring system 25 is equipped with the remote monitor server 22 and the device information database 23. It is possible for there to be no need that these are not necessarily exclusively for the machine user's 12 facility operations system 3, and to deal with it also about the information on other machine users' facility operations system (not shown).

[0205] The machine 9 of the machine user's 12 facility operations system 3 and a communication link are possible for the remote monitor server 22 through the communication link interface A24 and a communication line A15. And the information about the employment situation of a machine 9 is analyzed about reception and its employment situation to every [which acquires the employment information set up beforehand] period (for example, henceforth an " employment information acquisition period" for one month). With it, the correction factor in the next employment information acquisition period of a machine 9 is determined based on the result. A part of information about the determined correction factor and employment information are outputted to the maintenance evaluation system 1. Moreover, the received information and the information about the determined correction factor are saved in the device information database 23. In addition, the information about an employment situation can also be acquired by requiring of a machine 9 if needed.

[0206] The device information database 23 is connected to the remote monitor server 22, and the information about the employment situation of the machine 9 which the remote monitor server 22 acquired, the information about the employment conditions of the machine 9 beforehand set up based on insurance, information required for the decision of a correction factor, the information about the set-up correction factor, etc. are held. And according to a demand of the remote monitor server 22, drawing is possible for those information always.

[0207] The maintenance evaluation system 1 is equipped with the maintenance evaluation server 4 and the maintenance evaluation information database 5. It is possible for there to be no need that these are not necessarily exclusively for the machine user's 12 facility operations system 3, and to deal with it also about the information on other machine users' facility operations system (not shown).

[0208] The maintenance server 8 of the machine user's 12 facility operations system 3 and a communication link are possible for the maintenance evaluation server 4 through the communication link interface A24 and a communication line A15. And the information about the maintenance situation in the facility operations system 3 is analyzed about reception and its maintenance situation to every [which acquires the maintenance information set up beforehand] period (for example, it is called a "maintenance information acquisition period" for two years and the following at intervals of the turnaround of a machine 9). On the other hand, information, such as a correction factor computed from the employment situation of a machine 9, is outputted from the remote monitor server 22. The premium of the machine 9 in the

appropriate period of the facility operations system 3 is set up from information, such as the correction factor, and the analysis result of the above-mentioned maintenance situation. The information about the set-up premium is outputted to the insurance management system 2 as premium payment directions. Moreover, the received information and the information about the set-up premium are saved in the maintenance evaluation information database 5. In addition, the information about a maintenance situation can also be acquired by requiring of the maintenance server 8 if needed.

[0209] The maintenance evaluation information database 5 is connected to the maintenance evaluation server 4, and the information about discount of the information about the maintenance situation of the machine 9 which the maintenance evaluation server 4 acquired, the information about the maintenance plan sent to an insurance company based on the insurance information between an insurance company 11 and the machine user 12, information required for a setup of a premium, the set-up premium, or a premium etc. is held. And according to a demand of the maintenance evaluation server 4, drawing is possible for those information always.

[0210] The insurance management system 2 possesses the premium management server 6 and the insurance information database 7. There is no need that these are not necessarily exclusively for the remote monitoring system 25 or the maintenance evaluation system 1, and the combination with a process [need / other maintenance evaluation systems (not shown) or remote monitoring system (not shown), and other insurance / to be managed] etc. is also possible for it. Moreover, it is possible for there to be no need of being exclusively for the machine user's 12 facility operations system 3, and to deal with it also about the insurance management of other machine users' machine (not shown). Moreover, the insurance management system 2 is managed by the section [handling / the section / costs, such as accounting or an accounting section with another remote monitoring system 25 or maintenance evaluation system 1,].

[0211] The premium management server 6 is a server linked to the maintenance evaluation server 4. And procedure about the reception of the premium from the machine user 12 is performed, and also the information (premium payment directions) about the premium which the maintenance evaluation server 4 set up is answered, and procedure about a premium is performed based on the contents of a contract held at the information and the insurance information database 7.

[0212] The insurance information database 7 is connected with the premium management server 6. And the information about the premium set up to said machine user's 12 machine 9, the information about premium procedure, and the information about a runner continuation of the various costs set up based on insurance are held. According to a demand of the premium management server 6, drawing is possible for those information always.

[0213] A communication line A15 is a communication line which connects an insurance company 11 and the machine user 12. They are a public line, the Internet circuit, or a dedicated line. Moreover, it is also possible to carry out by the communication link by wireless. It uses, in order that the remote monitoring system 25 and the maintenance evaluation system 1 may communicate the information about employment, and the information about maintenance from the facility operations system 3.

[0214] The communication link interface A24 is an interface for a communication link which they use in case the remote monitoring system 25 and the maintenance evaluation system 1 communicate with the facility operations system 3 through a communication line A.

[0215] Next, the machine user 12 as a machine user station is explained. The facility operations system 3 possesses the maintenance server 8, a machine 9, and the maintenance database 10. And it manages about maintenance of a machine 9, and also the information on the operation situation in the machine set as the object of insurance is held. And a remote monitor is carried out by the appropriate facility relevant to the machine user 12, and the operation situation can cope with it quickly to generating of accident or abnormalities, or its omen.

[0216] It connects with a machine 9 and the maintenance database 10, and the maintenance server 8 performs management about maintenance of a machine 9 while connecting with the maintenance evaluation server 4 of the maintenance evaluation system 1. With it, the information

about the maintenance situation of a machine 9 is acquired from the exterior of a machine 9 or the facility operations system 3, and it stores in the maintenance database 10. and periodical in the information concerning a maintenance situation according to a demand of the maintenance evaluation server 4 of an insurance company 11 -- or it transmits suitably. Moreover, the support is performed in case a machine 9 transmits the information about an employment situation according to a demand of an insurance company 11.

[0217] A machine 9 is the machine body and peripheral device which connect with the maintenance server 8 and are employed by the machine users 12. such as a gas turbine, and a boiler, a generator, and which are working in fact. In this example, it is a gas turbine. And the information about the employment situation of machine 9 self is held inside, and the information is transmitted to it through the maintenance server 8 according to a demand of an insurance company 11.

[0218] Since the accounting server 14, the communication line B16, the communication line C17, the communication line D18, and the financial agency station 13 are the same as that of an example 2, explanation is omitted.

[0219] Actuation of the gestalt of operation of the 2nd of the machine premium setting system which is this invention is explained to a detail using drawing 5, drawing 25. drawing 13 - drawing 16, drawing 17, and drawing 27. this example -- setting -- first -- the phase of the first insurance -- it is -- an insurance company -- RBM of the machine user's 12 machine 9 (gas turbine) -- a contract of amendment of the premium by the maintenance situation and employment situation based on law is made. In addition, the premium CC by the conventional approach is used for the premium in the time of the beginning as a criteria premium used as criteria. Next, if operation of a gas turbine (machine 9) is started, an insurance company 11 will acquire the information on the employment situation of a gas turbine for every employment information acquisition period by insurance, and will analyze. Moreover, the information on a maintenance situation is acquired and analyzed for every maintenance information acquisition period. And based on those results, it asks for Premium CE according to the premium count process B. It ****, and an employment information acquisition period may be longer than a maintenance information acquisition period, or may be short, may be the same, and is determined by insurance.

[0220] By this this invention, the machine user 12 is making an employment situation good. without carrying out severe operation, and performing maintenance plan and its implementation appropriately and efficiently, and since a premium may give a discount sharply. he becomes possible [tying to reduction of a premium and the improvement in an operating ratio of a gas turbine and reinforcement]. Moreover, for an insurance company 11. since the failure rate of a gas turbine falls sharply, it becomes possible to reduce expenditure of insurance money sharply.

[0221] With reference to drawing 25, drawing 5, and drawing 17, the process flow of premium decision is explained among actuation of the machine premium setting system of this invention. Here, a maintenance information acquisition period is set to T2, and it may be two years in this example. Moreover, an employment information acquisition period is set to T1, and it may be one month in this example.

[0222] First, in the phase before initiation (S201) of drawing 17, the insurance company 11 and the machine user 12 are performing insurance about the machine premium setting system of this invention. the inside of it -- the relation (equivalent to drawing 27) between the operating ratio forecast A of the setting period (the premium count and the insurance horizon which are set up beforehand) of a premium. the premium count approaches (above-mentioned premium count process B(1) - (9) etc.), and a gas turbine, and a premium, and RBM of a gas turbine -- the contract of acquisition of the maintenance information by the maintenance planned decision and the insurance company 11 which applied law, acquisition of the employment information on the gas turbine by the insurance company 11, etc. also included. Moreover, the machine user's 12 facility operations system 3, and the maintenance evaluation system 1 and the remote monitoring system 25 of an insurance company 11 are connected by the communication line A15 by the contract about acquisition of the maintenance information in insurance, and employment information. And the maintenance evaluation system 1 and the remote monitoring system 25 can

Premium CE. that is, based on failure rate lambdam (finishing [amendment]) of the correction factor (Kp, Ks, Kr) outputted by the remote monitor server 22 and a gas turbine proper. the use elapsed-years correction factor Ky. and the release time Tr at the time of failure. the premium CE in which maintenance information was made to reflect is computed (refer to premium (charge of maintenance -- and) count process B (9)). And the maintenance evaluation server 4 determines said premium CE as a next premium (S207). And the process for premium count is completed (S208). The determined next premium is outputted to the premium management server 6 as premium payment directions.

[0232] Amendment of the premium of a part based on the information on a maintenance situation is performed every maintenance information acquisition period T2 fundamentally. Namely, amendment of outage lambdam for calculating Premium CE is performed for every T2. In order to use the same lambdam in the meantime, Premium CE is changed using the information on an employment situation (correction factors Kp, Ks, and Kr).

[0233] The premium management server 6 sends the notice of a premium payment request for next month by the method of payment set up based on the contract of an insurance company 11 and the machine user 12 through a communication line D18 to the machine user's 12 accounting server 14. Since it is the same as that of an example 2, the process and related matters in connection with this payment are omitted.

[0234] Carrying out the above actuation to every [which was beforehand set up by insurance] period (the employment information acquisition period T1 and maintenance information acquisition period T2). the machine user 12 pays a premium to an insurance company. It continues within the term of insurance based on insurance. and payment of this premium is performed. However, changing about a period by a contract etc. is possible.

[0235] By actuation of the above this invention, a setup of a premium with profits is attained for an insurance company 11 and machine user 12 both sides. namely, the employment with the machine user 12 severe about a machine 9 (gas turbine) -- not carrying out -- and RBM -- there is a cost merit called the reduction of the costs in connection with [if decision and its operation profit of a suitable maintenance plan are performed, an operating ratio may improve by failure of a machine 9 decreasing, and a premium may also decrease, and] employment of a machine 9, or premium expenditure based on law. In addition. in connection with generating of failure of a machine 9 becoming very low, an insurance company 11 becomes possible [reducing the probability of occurrence / insurance money / of payment sharply]. and can carry out an insurance enterprise more healthfully.

[0236] In this example. all (Kp, Ks, Kr) of the output at the time of employment, the count of start and stop. and three kinds of correction factors in connection with the output rate of change per unit time amount are used. However, if at least one kind of value of three kinds of inside is used even when not using all of those values. it can carry out like this example. For example, when it has become clear that very strong effect is leaked to a failure rate lambda depending on [case / where the count of start and stop is others] the class of machine 9, it is also possible to calculate and use a failure rate lambda as not using Kp and Kr (or Kp=Kr=1). The same is said of an output and output rate of change.

[0237] Moreover, in this example. although an output, the count of start and stop. and output rate of change are referred to in order to measure the employment situation of a machine 9, this is because the gas turbine is made into the example. It is possible by using other suitable parameters according to the class of machine 9 to grasp the failure rate of a machine 9 to accuracy more. For example, if it is chemical reaction equipment, they are an operating temperature, the rate of change and an operating pressure, the rate of change. the count of a shutdown, etc. It is an important point to choose what has influence on generating of failure greatly in the various parameters which show the employment situation of the machine.

[0238] Moreover, in this example, the premium management server 6 is performing procedure about a premium. This is because it assumes that the section which takes the necessary procedure for the premium relation in an insurance company 11 is different from the section which manages the remote monitoring system 25 and the maintenance evaluation system 1. However, they are able to carry out this invention according to the situation in an insurance

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acquire the above-mentioned information now from the facility operations system 3 through a communication line A15 by the demand. The premium CC by the conventional approach is used for the premium in this phase (at the time of the beginning) as a criteria premium used as criteria.

[0223] With reference to drawing 17. the remote monitor server 22 acquires the data about an employment situation from a gas turbine after the beginning of mission of a gas turbine to every employment information acquisition period T1 (this example one month) (drawing 17. S202). The data about an employment situation are the output at the time of the employment in a gas turbine. a count of start and stop. and the output rate of change per unit time amount. In the case of this example. the information for 1 month is acquired. The acquired information is memorized in the device information database 23.

[0224] Next, based on those data, the remote monitor server 22 determines the above-mentioned correction factor (Kp, Ks, Kr) (S203). in decision, it carries out in the process of (1) of the above-mentioned premium (charge of maintenance -- and) count process B. (2). and (3). respectively. In addition. the data about drawing 13 -- drawing 15 are held in the device information database 23.

[0225] The remote monitor server 22 acquires failure rate lambdamc of the gas turbine proper currently held in the device information database 23. the use elapsed-years correction factor Ky. and the release time Tr at the time of failure while computing and determining a correction factor (Kp, Ks, Kr) as mentioned above (S203). Those information is outputted to the maintenance evaluation server 4. In addition. the computed information is memorized in the device information database 23.

[0226] The maintenance evaluation server 4 changes failure rate lambdamc of a gas turbine proper into lambdam based on the information about a maintenance situation (lambda m=lambda mc when [However] there is no information about maintenance). Kp, Ks, Kr. and lambda which were obtained -- m and Ky -- being based -- several 6:lambda=a-Ky-Ks-Kr-lambdam of above-mentioned premium (charge of maintenance -- and) count process B (4) The failure rate lambda of a gas turbine is computed (S204).

[0227] the repair time amount T which must stop a gas turbine on the other hand for repair etc. when failure occurs -- several 7 of above-mentioned premium (charge of maintenance -- and) count process B (5) -- :T=Td+Tr.It is computed (S205). However, time amount, Tr which detection takes from Td:failure generating: It is the time amount which restoration of failure takes. Here, by the remote monitor of the gas turbine by the device facility user 12, since it is a short time very much. Td can be disregarded to Tr.

[0228] next, the operating ratio forecast A which is a forecast of the operating ratio of next month of a gas turbine -- several 9:A=mu/(lambda+mu) of above-mentioned premium (charge of maintenance -- and) count process B (6) It computes (S206). however, the recoverability mu -- several -- 8:mu=1/T it is.

[0229] The maintenance evaluation server 4 determines the premium C based on an employment situation as the last. the operating ratio forecast A computed as mentioned above -- being based -- the amount of a loss D -- several 10 of above-mentioned premium (charge of maintenance -- and) count process B (7) -- :D=Kg (1-A) It computes. Premium C is computed from this value (refer to premium count process B (8)). (the charge of maintenance -- and) In addition. the data about drawing 27 are held in the maintenance evaluation information database 5.

[0230] here. from a start up. till after the first maintenance information acquisition period T2 (this example for two years) progress, in order that there may be no information on a maintenance situation. the premium C only based on the information on an operation situation is used as a premium of a forward type (this time lambdam=lambdamc: -- with no amendment). That is, the maintenance evaluation server 4 determines said premium C as a next (next month) premium (S207). And the process for premium count is completed (S208). The determined next premium is outputted to the premium management server 6 as premium payment directions.

[0231] On the other hand. since the information about a maintenance situation also becomes acquirable, after the first maintenance information acquisition period T2 progress computes

company 11, even if three servers, the remote monitor server 22, the maintenance evaluation server 4, and the premium management server 6, are unified by two or one. In connection with it, the device information database 23, the maintenance evaluation information database 5, and the insurance information database 7 should just also unify appropriately if needed according to a server's situation. In that case, there is a merit of the cost by saving of a server.

[0239] Moreover, an insurance company 11 is able to perform the role of the financial agency station 13 in this example. What is necessary is just to make it the insurance management system 2 have the function of the financial agency station 13 in that case. The premium management server 6 and the accounting server 14 are made to link directly by the communication line without making the financial agency station 13 intervene. And while an insurance company 11 keeps the machine user's 12 fund and performs investment management, a premium is pulled out if needed. In this case, payment of the commission to a financial agency station etc. does not occur, but it is connected with both cost reductions.

[0240] Furthermore, in the condition of drawing 25, although acquisition of the information about the employment situation of the machine 9 by the remote monitoring system 25 belongs to the insurance company 11. as it is shown in drawing 26, it is also possible to entrust the firm 21 specializing in management which is a firm which performs the remote monitor of another device facility. For example, if the manufacturer of a machine 9 is performing the remote monitor, the section which performs a manufacturer's remote monitor will serve as the firm 21 specializing in management in drawing 26 by the contract between 3 persons of a manufacturer, an insurance company 11, and the machine user 12 etc. That is, by entrusting the business in connection with a part of the information gathering and premium payment count about the employment situation of a machine 9 to a manufacturer, an insurance company 11 loses its need of owning the remote monitoring system 25. and is connected with cost reduction. In that case, it is also possible to make it to set, to make only the information gathering about the employment situation of a machine 9 perform in the remote monitoring system 25, and make the business in connection with the premium payment count based on the information perform to the maintenance evaluation system 1 of an insurance company 11.

[0241] Furthermore, in this example, although the insurance management system 2 belongs to the insurance company 11, it may belong to the financial agency office 13. That is, by entrusting the business in connection with premium payment, an insurance company 11 loses its need of owning the insurance management system 2 to the financial agency station 13, and is connected with it at cost reduction.

[0242] In that case, in an insurance company 11, the remote monitoring system 25 acquires the employment information about the employment situation of the device facility 3, the maintenance evaluation system 1 acquires the information about a maintenance situation, and a premium is determined by the approach in the above-mentioned example from the employment situation, maintenance situation, and insurance. And premium payment directions are outputted to the insurance management system of the financial agency station 13. Based on premium payment directions, the insurance management system 2 of the financial agency station 13 acquires a premium from the machine user 12 (or the account) by technique, such as an account transfer and electronic commerce, and remits to an insurance company 11 (or the account).

[0243] Moreover, in this example, the value of each multiplier (Kp, Ks, Kr, lambdam, Tr, Kg) currently used is a value beforehand set up in principle by the class of machine 9, the busy condition of magnitude and its moon, etc., and is held in the device information database 5. As for those values, it is possible to also make it change based on a past employment situation and a past maintenance situation. By making it such, it becomes the form which suited the employment situation of a machine 9 more, and the machine user 12 becomes the more powerful incentive which keeps good employment in mind, and the value of a premium becomes possible [enlarging more the machine user's 12 premium, and the reduction effectiveness of the insurance money of an insurance company 11].

[0244] In this invention, the information about a maintenance situation is reflected in failure rate lambdam in the premium count processes A and B. However, after calculating a premium, it is also possible to take the approach of giving a discount, based on the information about a

maintenance situation. That is, suppose that the discount rate of a premium is used as information about modification of a premium. For example, when a maintenance situation is good, according to the degree, a premium is referred to as giving a discount 30% 20% 10%. Thereby, profits are got by both the above insurance companies and machine users.

[0245] Moreover, in explanation of each example of this invention. when an employment situation and a maintenance situation are good, it is supposed that a premium will fall [drawing 21 and drawing 27]. However, when an employment situation and a maintenance situation are not in a desirable condition, naturally possibility that it must stop having to pay a high amount of money as compared with the usual premium is one of the contents of the machine premium setting system a certain thing of whose is also this invention. When an employment situation and a maintenance situation are not in a desirable condition, a machine user may think that a kind of penalty is imposed. That is, if an employment situation is bad, since the correction factor (Kp. Ks, Kr) in premium count will exceed 1.0, the amount of a loss mounts up and a premium also increases. Moreover, if a maintenance situation is bad, since failure rate lambdam in premium count will increase, the amount of a loss mounts up and a premium also increases.

[0246]
[Effect of the Invention] By this invention, a machine user becomes possible [reducing payments of the charge of maintenance, and a premium according to the maintenance approach of a machine]. things can be carried out. an insurance company can also reduce the possibility of insurance money payment, and a manufacturer becomes possible [the thing which reduce possibility that a maintenance cost will pay and for which profits are brought to both sides with a machine user, a manufacturer, and an insurance company].

[0247] Moreover, it becomes possible to perform a setup of the high charge of maintenance of precision which reflected the maintenance situation or employment situation of a machine correctly, and a premium by this invention.

[Translation done.]

* NOTICES *

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1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the block diagram showing the gestalt of operation of the first of the charge setting system of machine maintenance of this invention.
[Drawing 2] It is the graph which shows the relation of the amount of a loss and a charge setup of maintenance in the gestalt of operation of the first of the charge setting system of machine maintenance of this invention.
[Drawing 3] It is drawing explaining the effectiveness of the risk base assessment in connection with the charge setting system of machine maintenance of this invention, and a machine premium setting system.
[Drawing 4] It is drawing explaining the approach of the risk base assessment in connection with the charge setting system of machine maintenance of this invention, and a machine premium setting system.
[Drawing 5] It is a flow Fig. in connection with actuation of the gestalt of operation of the charge setting system of machine maintenance of this invention, and a machine premium setting system.

[Drawing 6] It is the graph which shows the relation between the output of a machine, and a failure incidence rate.
[Drawing 7] It is the graph which shows the relation between the count of start and stop of a machine, and a failure incidence rate.
[Drawing 8] It is the graph which shows the relation between the output rate of change of a machine, and a failure incidence rate.
[Drawing 9] They are other block diagrams showing the gestalt of operation of the first of the charge setting system of machine maintenance of this invention.
[Drawing 10] It is the block diagram of further others showing the gestalt of operation of the first of the charge setting system of machine maintenance of this invention.
[Drawing 11] It is another block diagram showing the gestalt of operation of the first of the charge setting system of machine maintenance of this invention.
[Drawing 12] It is the block diagram showing the gestalt of operation of the second of the charge setting system of machine maintenance of this invention.
[Drawing 13] It is the graph which shows the relation of the correction factor and output in connection with the charge setting system of machine maintenance of this invention, and a machine premium setting system.
[Drawing 14] It is the graph which shows the relation of the correction factor and the count of start and stop in connection with the charge setting system of machine maintenance of this invention, and a machine premium setting system.
[Drawing 15] It is the graph which shows the relation of the correction factor and output rate of change in connection with the charge setting system of machine maintenance of this invention, and a machine premium setting system.
[Drawing 16] It is the graph which shows the relation of the correction factor and use elapsed years in connection with the charge setting system of machine maintenance of this invention, and a machine premium setting system.

[Drawing 17] It is a flow Fig. in connection with actuation of the gestalt of other operations in connection with the charge setting system of machine maintenance of this invention of this invention, and a machine premium setting system.
[Drawing 18] They are other block diagrams showing the gestalt of operation of the second of the charge setting system of machine maintenance of this invention.
[Drawing 19] It is the graph which shows the relation of the amount of a loss and a charge setup of maintenance in the gestalt of operation of the second of the charge setting system of machine maintenance of this invention.
[Drawing 20] It is the block diagram showing the gestalt of operation of the first of the machine premium setting system of this invention.
[Drawing 21] It is the graph which shows the relation of the amount of a loss and a premium setup in the gestalt of operation of the first of the machine premium setting system of this invention.
[Drawing 22] They are other block diagrams showing the gestalt of operation of the first of the machine premium setting system of this invention.
[Drawing 23] It is the block diagram of further others showing the gestalt of operation of the first of the machine premium setting system of this invention.
[Drawing 24] It is another block diagram showing the gestalt of operation of the first of the machine premium setting system of this invention.
[Drawing 25] It is the block diagram showing the gestalt of operation of the second of the machine premium setting system of this invention.
[Drawing 26] They are other block diagrams showing the gestalt of operation of the second of the machine premium setting system of this invention.
[Drawing 27] It is the graph which shows the relation of the amount of a loss and a premium setup in the machine premium setting system of this invention.
[Description of Notations]
1 Maintenance Evaluation System
2 Insurance Management System
3 Facility Operations System
4 Maintenance Evaluation Server
5 Maintenance Evaluation Information Database
6 Premium Management Server
7 Insurance Information Database
8 Maintenance Server
9 Machine
10 Maintenance Database
11 Insurance Company
12 Machine User
13 Financial Agency Station
14 Accounting Server
15 Communication Line A
16 Communication Line B
17 Communication Line C
18 Communication Line D
19 Communication Line E
20 Communication Line F
21 Firm specializing in Management
22 Remote Monitor Server
23 Device Information Database
24 Communication Link Interface A
25 Remote Monitoring System
26 Communication Line G
27 Communication Line H
28 Manufacturer

29 Communication Line I
30 Communication Line J
31 Communication Line K
32 Communication Line L
33 Maintenance Evaluation-System B
34 Costs Managerial System
35 Maintenance Evaluation Server B
36 Maintenance Evaluation Information Database B
37 Costs Management Server
38 Cost-Information Database
39 Firm specializing in Management
40 Communication Line M
41 Communication Line N
42 Communication Link Interface B
43 Communication Line O
44 Communication Line P

[Translation done.]